

# **Yamhill Agricultural Water Quality Management Area Plan**

**Developed by the  
Yamhill River Subbasin Local Advisory Committee**

**with assistance from**

**The Oregon Department of Agriculture**

**and**

**The Yamhill Soil and Water Conservation District**

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# **Acronyms and Terms Used in this Document**

**AgWQM Area Plan** – Agricultural Water Quality Management Area Plan

**AgWQM Area Rules** – Agricultural Water Quality Management Area Rules

**CAFO** – Confined Animal Feeding Operation

**CRP** – Conservation Reserve Program

**DEQ** – Oregon Department of Environmental Quality

**District** – Soil and Water Conservation District

**DSL** – Department of State Lands

**EPA** – United States Environmental Protection Agency

**EQIP** – Environmental Quality Incentive Program

**FOTG** – Field Office Technical Guide

**IPM** – Integrated Pest Management

**LAC** – Local Advisory Committee

**LMA** – Local Management Agency

**NRCS** – Natural Resources Conservation Service

**OAR** – Oregon Administrative Rules

**ODA** – Oregon Department of Agriculture

**ODF** – Oregon Department of Forestry

**ODFW** – Oregon Department of Fish and Wildlife

**ORS** – Oregon Revised Statute

**OSU** – Oregon State University

**PCM** – Prevention and Control Measure

**RUSLE** – Revised Universal Soil Loss Equation

**T** – Soil loss tolerance factor

**The Committee** – Local Advisory Committee

**The Department** – Oregon Department of Agriculture

**TMDL** – Total Maximum Daily Load

**USDA** – United States Department of Agriculture

**USLE** – Universal Soil Loss Equation

**WRP** – Wetlands Reserve Program

# Foreword

**This Agricultural Water Quality Management Area Plan provides guidance for addressing agricultural water quality issues in the Yamhill River Subbasin Agricultural Water Quality Management Area. The purpose of this plan is to identify strategies to reduce water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities, and monitoring. The provisions of this plan do not establish legal requirements or prohibitions.**

**The Oregon Department of Agriculture (Department) will exercise its enforcement authority for the prevention and control of water pollution from agricultural activities under administrative rules for the Yamhill River Subbasin (OARs 603-095-0500 through 603-095-0560) and Oregon Administrative Rules (OARs 603-090-0060 through 603-090-0120).**

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## Local Advisory Committee

This document was developed with the assistance of a Local Advisory Committee (the Committee). The Committee was formed in June of 1998 to identify water quality concerns in the Yamhill Basin and assist with the development of the Agricultural Water Quality Management Area Plan and Rules (Area Plan and Rules) with subsequent biennial reviews. The members are involved in a wide-variety of operations. Members are:

Name	Area	Operation	Affiliations
Sam Sweeney Chair	Dayton	General farming, row crops	Country Heritage Farms, Yamhill SWCD, Palmer Irrigation District
Don Christensen Vice-Chair	McMinnville	Grass seed, orchards	Christensen Farms, Oregon Seed League, Nut Society, Yamhill SWCD
Dan Bansen	Dayton	Dairy	Forest Glen Jerseys, Farmers Co-op Creamery, National All Jersey Director
Don Duhrkopf	Dallas	Small woodlot, hay, cattle	Polk Soil and Water Conservation District
Allan Elliott	Dayton	Nursery	Carlton Plants Oregon Association of Nurserymen
Lucien Gunderman	McMinnville	Livestock	Crown Hill Farms
Gary Johnson	Carlton	General farming	Farm Bureau
Steve Jones	McMinnville	General farming	Select Seed Wheat League, Oregon Clover Growers
Ernie Strahm	Carlton	Livestock, small woodlot	City of McMinnville Water Reclamation Facility
Tom Thomson	Dallas	General farming, grass seed	Polk Soil and Water Conservation District
Denny Wilfong	Dallas	General Farming	Wilfong Farms Wheat League, Farm Bureau
Rod Volbeda (Alternate)	West Salem	Dairy	Volbeda Farms Polk Soil and Water Conservation District

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# Introduction

This document is the Plan for the enhancement of water quality from agricultural activities in the Yamhill Basin. The Plan was created following passage of the Agricultural Water Quality Management Act (AgWQM Act), now codified at ORS 568.900-.933, which requires the reduction of pollution from agricultural sources. The Plan was developed by the Committee consisting of affected landowners residing within the Basin, with assistance from the Oregon Department of Agriculture (the Department) and the Yamhill and Polk Soil and Water Conservation Districts (District). This Plan applies to all lands, regardless of size, within the Yamhill Basin currently in agricultural use. For example, the Plan applies equally to large commercial production lands and to small rural lands grazing a few animals. It also applies to all agricultural lands that are lying idle or on which management has been deferred. However, activities subject to the Forest Practices Act are not subject to this Plan.

The intent of the AgWQM Act is to:

- enhance and protect water quality, addressing state and federal water quality standards
- encourage voluntary conservation efforts by landowners,
- conduct an education program to inform operators of water quality issues and conservation solutions,
- allow farmers and rural landowners the flexibility to choose appropriate methods to meet water quality goals, and
- provide enforcement provisions for landowners, operators, or occupiers who refuse to work towards meeting water quality standards.

To fulfill the requirements of the AgWQM Act, the Department coordinated the development of AgWQM Area Plans and Rules for basins throughout Oregon. Each plan outlines education strategies to inform landowners about water quality issues and encourage farmers and rural landowners to adopt conservation measures. The Plan encourages landowners, occupiers or operators to develop voluntary conservation plans, which outline management strategies for addressing pollution. *An approved voluntary conservation plan provides landowners, operators, or occupiers with limited protection against immediate enforcement actions by the Department, if violations of the prevention and control measures are found to occur on their lands. Please refer to the Enforcement section of this Plan for details on limited protection.*

Through a Memorandum of Agreement, the Department designated the Yamhill District as its Local Management Agency (LMA) for the development and implementation of this Plan. The Yamhill District works cooperatively with the Polk District, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), USDA Farm Service Agency (FSA), and Oregon State University Extension Service to provide technical, financial, and educational assistance to agricultural landowners, operators, or occupiers in the Yamhill Basin. The Yamhill District also coordinates partnerships between local agencies, volunteer organizations, and private landowners to address natural resource and conservation issues.

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## **Mission**

The mission of this Plan is to promote sound agricultural conservation within a framework of economic profitability and agricultural viability. The Plan is designed to achieve applicable chemical, physical, and biological water quality standards.

The Committee used the following guiding principles in the development of this Plan:

- Control pollution as close to its source as possible.
- Base actions on scientifically based conservation planning.
- Promote a variety of conservation practices in order to address individual situations.
- Recognize the need for landowners, operators or occupiers to maintain agricultural profitability.
- Protect beneficial uses of water in the Yamhill Basin.

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# Background

## Geographical and Physical Setting

The Yamhill Basin is located in Yamhill County and the northern portion of Polk County, Oregon. It has an area of 769 square miles. The basin drains to the Yamhill River, which, in turn, drains to the Willamette River near Dayton. Although Chehalem Creek is not a tributary of the Yamhill River, its drainage resides within Yamhill County and is therefore included within the Yamhill Basin Area Plan boundary. The Chehalem Creek drainage basin has an area of 56 square miles and includes a few small streams that flow directly to the Willamette near Newberg and Dundee. The Chehalem Creek land area draining to the Willamette River within Yamhill County is clearly illustrated in the Yamhill Basin boundary map for purposes of this Plan (See map 1). Elevation in the Yamhill Basin ranges from 60 to 3,600 feet. The amount of rainfall ranges widely, from 40 inches at the valley bottom to 150 inches at the highest elevations in the basin.

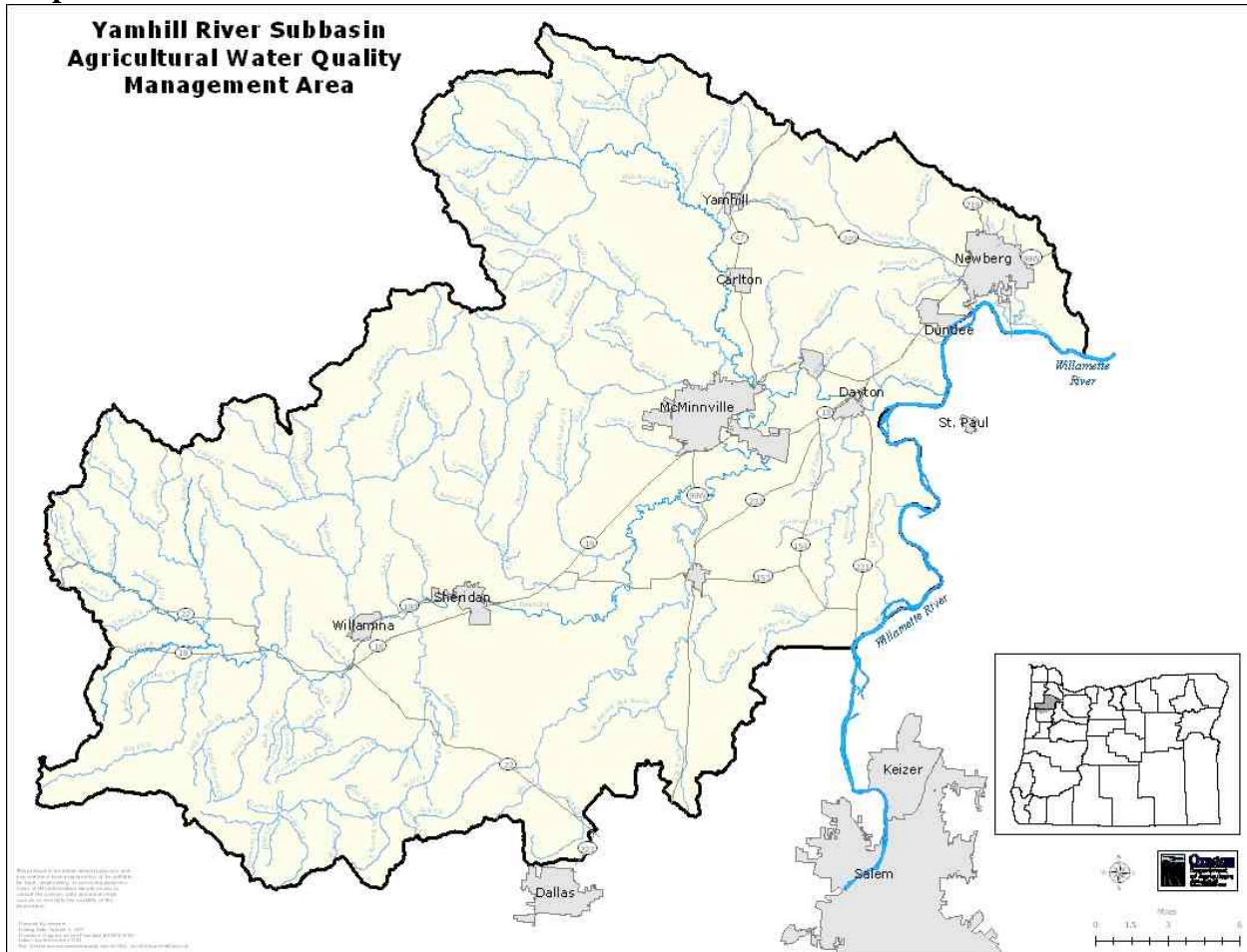
Though the predominant land uses in the Yamhill Basin are forestry and agriculture (see Table 1), urban areas are growing rapidly. In 1900, the population of Yamhill County (which comprises 70 percent of the basin) was 13,000 (Otte et al, 1974). The current population of Yamhill County is approximately 95,000 (US Census Bureau, 2007), and by 2040 it is projected to be approximately 166,000 (Oregon Department of Administrative Services, 2007). Urban development is concentrated in the nine small cities in the county. Approximately 186,000 acres of Yamhill County are farmlands, down from 284,000 in 1900. There are approximately 1,800 farms in the county, with an average size of 103 acres (US Census of Agriculture, 1997). In 2007, this increased to approximately 2,115 farms in the county, with an average size of 86 acres (US Census of Agriculture, 2007). Please note that these numbers are for Yamhill County only, while the figures in Table 1 are for the whole basin.

Table 1. Ownership and Land Use Types in the Yamhill Basin.

<b>Ownership</b>	<b>Acreage</b>		<b>Land Use</b>	<b>Acreage</b>	
Federal	43,786	acres	Irrigated farmland	38,365	acres
State	2,459		Non-irrigated farmland	155,275	
Tribal	10,000		Range / Pasture	62,931	
Private	435,671		Forest	223,300	
			Urban	8,000	
<b>Total Area</b>	<b>491,916</b>	<b>acres</b>	Still Water	645	
			Other	3,400	
			<b>Total</b>	<b>491,916</b>	<b>acres</b>

The forested areas are generally in the western part of the watershed, in the foothills and upper elevations of the Coast Range. Additional forestland occurs in isolated tracts in the Amity-Eola Hills, Red Hills of Dundee, and the Chehalem and Parrett Mountains. Commercial forest is under public and private ownership. Public lands include those of the Siuslaw National Forest and Bureau of Land Management. Private ownerships are industrial and non-industrial forests and smaller woodlots. The Confederated Tribes of Grand Ronde also own commercial forest in the western part of the watershed.

**Map 1. Yamhill Basin.**



Much of the watershed is intensively farmed. Intensive agriculture includes highly productive cultivated land such as orchards, vineyards, nursery stock, grasses, legumes, row crops, dairy farms, irrigated hay and pasture, and dry-land farm crops (e.g., cereal grains). The diversity of agriculture is expressed in Table 2. The majority of the farmland in the basin is in the southern and eastern portions of Yamhill County and the northeastern portion of Polk County. Most of the major crops, such as cereal grains, orchards, and grasses are grown on the low foothills and the main valley terrace. Irrigated vegetable and specialty crops such as nursery products, vegetables for processing and fresh market, corn for silage, hay and alfalfa, are generally grown on the alluvial bottomlands (A large portion of the agricultural land is artificially drained. The slopes of most of the cultivated land range from zero to eighteen percent.

**Table 2. Major crops in Yamhill County.**

<b>Crop</b>	<b>Acres planted in 2008</b>	<b>Livestock</b>	<b>Number of head</b>
All wheat	6,550	Cattle & calves inventory	25,900
All hay	19,000	Cattle & calves sold	NA
Oats	1,250	Beef cows	5,800
Silage corn	2,500	Milk cows	5,000
Barley	50	Sheep, ewes, & lambs	13,000
Grass and legume seeds	51,359	Hogs & pigs	1,000
Hazelnut	6,680	Chickens	4,209,700
Tree Fruit	1,600	Horses, Mules, Burros & Donkeys	3,800
Wine grapes	5,035		
Christmas trees	3,600	Goats	600
Sweet corn, processing	Not in 2008 Report		
Snap beans, processing		Llamas <sup>2</sup>	NA
Onions, storage			
Nursery / Greenhouse	5,500		
Berry crops (strawberries, black raspberries, blackberries, boysenberries, blueberries)	1,210		

Sources: Oregon Agriculture & Fisheries Statistics (2005-2006).  
Census of Agriculture (2002).

<sup>2</sup>Bob Wynea, President of the Willamette Valley Llama Association (1999).

The types of crops grown in the Yamhill Basin have shifted during this century and these changes have caused physical impacts in the basin. Most of the basin's farmland was planted in dryland crops such as oats and barley until the early 1940's. Since then, agricultural production in the basin has diversified to include irrigated specialty crops and a greater variety of dryland crops. The growth in specialty crops has been accompanied by increased withdrawals from streams in the basin. The potential for soil erosion is dependent on the cropping system.

Typically, annual cropping systems have greater potential for soil erosion than perennial cropping systems.

Farming practices in the Yamhill Basin have also undergone changes. Cover cropping in certain perennial crops is becoming an accepted method of reducing soil erosion. Flailing in orchard crops for vegetation control has become a routine practice. Farmers have also begun practicing residue management on highly erodible land. Confined animal feeding operations, especially dairy farms, have worked to better contain wastes with manure storage systems and apply them based on crop nutrient needs.

Because there is no snowpack in the Yamhill Basin in an average year, rainfall provides most of the area's water. As is typical in a rainfall watershed, the impact of water entering into streams is more immediate and of shorter duration than in a watershed supplied with snowmelt. Additionally, the water contributed to streams through rainfall is generally at a higher temperature than is snowmelt. About 85 percent of the total annual rainfall in the area usually falls during the period September through April, and soils on the floodplains are subject to occasional to frequent flooding during the winter (Knezevich, 1982).

## **Water Resources**

Appropriated water in the Yamhill Basin is diverted for agricultural, municipal, and commercial use. The primary use for which water rights are issued in the Yamhill Basin is irrigation. The amount of water appropriated in the basin is 8,300 annual acre feet (one acre foot covers one acre of land with a foot of water), with 6,423 acre feet of this allocated for irrigation (Oregon Water Resources Department, 1998). There are 24,907 acres of irrigated land in Yamhill County (Census of Agriculture, 2002). The water used for irrigation comes from several sources in the Yamhill Basin. These sources include impoundments, groundwater, out-of-basin transfers, and streams throughout the basin. Additionally, the Palmer Creek Water District Improvement Company diverts water from the Willamette River and excess water is returned to the Yamhill. Presently, there are no further appropriations of surface water allowed in the South Yamhill River, and most other basins are fully appropriated in the summer. With all appropriated water, the date of water right determines seniority. Junior water rights have lower priority and the user may be forced to cease irrigation under extreme conditions.

Stream flow in the Yamhill Basin varies throughout the year and the high and low flows have different impacts on the landscape and resources. Stream flows vary widely between summer and winter largely due to the amount of rainfall. The greater amount of water diverted for irrigation during the summer also contributes to the fluctuations in flow. The South Fork of the Yamhill River, for example, has an average flow of 30 ft<sup>3</sup>/sec during the summer low flow condition and 6,000 ft<sup>3</sup>/sec during the winter high flow condition. During the winter high stream flows, a prominent resource concern is soil erosion. Also, leached nutrients and pesticides can negatively affect water quality and can serve as an economic loss for producers. During periods of low stream flow, nutrients, heat load, and pesticides can more easily impact water quality because lower stream flows provide less dilution of contaminants. Additionally, the higher stream temperatures associated with low flow in the summertime are a major factor affecting aquatic life.

## Water Quality

The Committee consulted many sources when determining water quality issues in the Yamhill Basin. These sources are listed in Table 3. While this is not a complete list of available data, water quality trends for the area are established utilizing the data.

[nhg1]

Several stream segments within the Yamhill River Basin (including Chehalem Creek) have been declared "water quality limited or impaired" and have been placed by the Oregon Department of Environmental Quality (DEQ) on the 303(d) List. This List is named after Section 303(d) of the Clean Water Act, which requires states to monitor water quality and develop programs to improve water quality for waters that do not meet water quality standards. Water quality standards are developed based on the most sensitive beneficial use (refer to Appendix B). The 303(d) list of impaired waters must be submitted to US Environmental Protection Agency (EPA) for review and approval. Total Maximum Daily Loads (TMDLs) must be developed for all waterbodies on the approved 303(d) list.

A TMDL represents the maximum amount of a pollutant allowed to enter a waterbody by law so that the waterbody will meet and continue to meet the water quality standard for that particular pollutant. Common pollutants and conditions include metals, toxic chemicals, fecal coliform bacteria, temperature, and excessive nutrients.

Appendix A identifies the stream segments that are "303(d) Listed" for bacteria (fecal coliform), temperature, chlorophyll a, Chlorophylls, dissolved oxygen, iron, nutrients, and manganese. The 303 (d) Listed streams are shaded in the table. These 303(d) Listed water quality parameters are described in Appendix B. Details on the specific types of Toxics can be found at <http://www.deq.state.or.us/wq/assessment/rpt0406.htm>.

Surface water quality in the Yamhill Basin varies seasonally. During the summer low flow periods, sections of the middle and lower reaches of the Yamhill River have poor water quality for several parameters. Some seasonal variation in water quality in the Yamhill Basin probably occurred prior to European settlement due to the natural characteristics of the stream. Diversion of water and hydrologic changes (created by activities such as tiling or impoundments) have exaggerated seasonal variations. This reduction in flow and some loss of shading by riparian vegetation have probably contributed to some increases in water temperature. Also, point and nonpoint source wastewater discharges have adversely affected water quality.

There are several potential sources of water pollution in the Yamhill Basin. Point source pollution emanates from clearly identifiable discharge points such as wastewater plants and industrial operations. Non-point source pollution originates from the general landscape and is difficult to trace to a single point. Non-point sources of pollution in the Yamhill Basin include erosion from agricultural, rural, and forestlands and stream banks, roadsides, and development in urban areas; contaminated runoff from livestock and other agricultural operations; and contaminated runoff from established urban areas, septic systems, and natural sources. Pollutants from non-point sources are carried to the surface water or groundwater through the action of rainfall, irrigation runoff, and seepage.

Table 3. Water quality data for the Yamhill Basin.

Data Source	Parameter	Sample Site	Date	Author	Value of Study
Water Quality Assessment - Oregon's 2004/2006 Integrated Report and Database <a href="http://www.deq.state.or.us/wq/assessment/rpt0406.htm">http://www.deq.state.or.us/wq/assessment/rpt0406.htm</a>	All	Sites throughout Oregon	1998 2002 2004	Oregon Dept. of Environmental Quality	Water quality status for water bodies in Oregon.
Oregon Dept. of Environmental Quality - Water Quality Monitoring Program	All	3 monitoring station [nhg2]sites: Yamhill River at Dayton (10363), North Yamhill River at Poverty Bend Road (10929), South Yamhill River at HWY 99W (10948)	Ongoing	Oregon Dept. of Environmental Quality	Statistical monitoring data.
Distribution of Dissolved Pesticides and Other Water Quality Constituents in Small Streams, and their Relation to Land Use, in the Willamette River Basin, OR, 1996	Pesticides, nutrients, conventional parameters	3 sites: tributary to Ash Swale, tributary to S. Yamhill, West Fork Palmer Creek	1996	Chauncey Anderson et al., USGS	Provided baseline data on pesticides and nutrients in the Yamhill Basin.
Phosphorus Loading in Baker Creek, Oregon	Phosphorus	18 sites along Baker Creek	1992	Scott Stewart, Dept. of Soil Science, OSU	Interpretation needed.
1998 Temperature Monitoring Report	Temperature	Mill and Turner Cr. Basins; sites on Cospers and Rowell Cr. & S. Yamhill R.	1999	Yamhill Basin Council	Documented temperatures from mouth to headwaters; verified accuracy of 303(d) listings.
Endangered Species List	Steelhead		1999	National Marine Fisheries Service, US Fish and Wildlife	Aquatic species of concern (habitat requirements).
2003-2004 Water Quality Monitoring Final Report	Temperature, dissolved oxygen, turbidity, pH, conductivity, <i>E. coli</i> , and macro-invertebrates.	25 sites throughout the Yamhill Basin.	2003/ 2004	Yamhill Basin Council	Characterized water quality in 303(d) listed streams and helped in selection of potential restoration sites.
North Yamhill River Subwatershed Water Quality Monitoring Final Report	Temperature, dissolved oxygen, turbidity, conductivity, <i>E. coli</i> , flow, macro-invertebrates, and physical habitat.	17 sites on the North Yamhill River, Panther Creek, and Baker Creek.	2007	Yamhill Basin Council	Characterize water quality in the North Yamhill Watershed.

## Water Quality Standard for Phosphorus

A study conducted by the DEQ during the summer of 1988 determined that sections of the South Fork, North Fork and the mainstem Yamhill River exceeded water quality standards for pH. Analysis of the data determined that phosphorus levels in the river were causing an increase in algae populations and, in turn, pH. The data also indicated the wastewater treatment plants located in the communities of McMinnville, Carlton, Lafayette, and Yamhill were significant sources of phosphorus.

In response to this study, the Oregon Environmental Quality Commission, in June of 1989, established more stringent standards to improve water quality on the Yamhill River. These standards included a TMDL for phosphorus in 1992 for the streams listed in Appendix A.

The cities of McMinnville, Carlton, Lafayette, and Yamhill took steps to meet the new TMDL for phosphorus. The summer low flow conditions in the river were found to be a critical time for phosphorus concentrations, while winter stream conditions were not affected by phosphorus. As a result, both Yamhill and Carlton wastewater treatment plants no longer discharge to the Yamhill River during summer months, and the cities of Lafayette and McMinnville utilize chemical treatment to reduce the phosphorus discharged.

The TMDL process also established an allocation for the load of phosphorus entering streams through agricultural activities and other sources. TMDLs to address bacteria, mercury, and temperature for nine (Mollalla-Pudding and Yamhill scheduled for 2007 and 2010, respectively) of the Willamette River Basins were finalized and approved by EPA and DEQ in September 2006. The Middle Willamette Basin, which includes the Chehalem Creek portion of the Yamhill River Basin under this AgWQM Area Plan, is one of the nine basins. This AgWQM Area Plan is a tool for implementing the nonpoint source controls required by a TMDL for phosphorus, bacteria, mercury, and temperature.

## Biological Resources

The diversity and acreage of natural wildlife habitats in the basin has been reduced as land has been converted from natural forest and grasslands to managed forests, pasture, cropland, homesteads, and urban areas. Studies estimate that around 40 percent of the original wetlands in the Willamette Valley have been lost (Gabriel, 1993). As a result, some of the ecological functions of wetlands and riparian areas have been impaired. These areas filter contaminants, trap sediment, and provide wildlife habitat. Wetland and riparian vegetation also minimizes hydrologic fluctuations by retaining water during high flows. This water may then replenish groundwater or provide shallow subsurface flow to streams. Both of these flow mechanisms are important for water quality with groundwater providing most of the instream water during summertime periods of low precipitation.

The Yamhill Basin hosts a number of vertebrate species that depend on aquatic habitats. Native, non-game fish include red-side shiner (*Richardsonius balteatus*), northern pike minnow (*Ptychocheilus oregonensis*), largescale (*Catostomus columbianus*) and bridgelip (*Catostomus*

*macrocheilus*) sucker, Pacific lamprey (*Lampetra tridentata*), brook lamprey (*Lampetra richardsoni*), and several species of sculpin (*Cottus spp.*). Also native are winter steelhead (*Oncorhynchus mykiss*) and perhaps the basin's most widely distributed fish, cutthroat trout (*Oncorhynchus clarki*). Although adult Willamette spring chinook salmon do not spawn in the Yamhill Basin, juvenile spring chinook salmon (*Oncorhynchus tshawytscha*) have been found to use streams in the lower portion of the basin during the winter months for seasonal rearing (Galovich, 1999). Other aquatic vertebrates in the basin include several amphibians such as the Pacific giant salamander (*Dicamptodon ensatus*), tailed frog (*Ascaphus trueii*), red-legged frog (*Rana aurora*), and Columbia seep salamander (*Rhyacotriton kezeri*). Several mammalian species also depend on the waters of the Yamhill Basin. Beavers (*Castor canadensis*), muskrats (*Ondatra zibethica*), and river otters (*Lutris canadensis*) are common throughout the region. American dippers, green herons, belted kingfishers, and several other bird species also live and feed in the basin's aquatic habitats.

Several of the Yamhill Basin's fish and aquatic vertebrate populations are currently in decline. The Upper Willamette steelhead is listed under the Endangered Species Act. Pacific lamprey (another anadromous, cold water species) is currently listed as vulnerable on the Oregon Sensitive Species List and is of special concern to tribal communities due to its cultural importance. The Columbia seep salamander and the Western pond turtle are currently listed as critical on the state Sensitive Species List, while the status of the tailed frog and red-legged frog is vulnerable.

Ongoing conservation efforts in the Yamhill Basin are benefiting wildlife habitat. Conservation practices such as wetland restoration, upland habitat planting, tree and shrub planting, and riparian restoration create new habitat. Many producers are working with the Soil and Water Conservation Districts in the Yamhill Basin to implement these types of measures that will benefit wildlife in the future.

## Summary

Good water quality is a benefit to many different uses. Beneficial uses of water in the Yamhill Basin include fishing; swimming; boating; habitat for aquatic organisms and wildlife; native species enhancement; agricultural, domestic, municipal, and industrial water supplies; and aesthetics. While there may not be severe impacts on water quality from a single source or activity, the combined effects from all sources contribute to the impairment of beneficial uses of the Yamhill River Basin water. Most of the impacts on beneficial uses are recognized during summer, low flow periods. Water impairments are often the result of activities that occur, however, in the fall and winter months.

During the development of this AgWQM Area Plan, the Yamhill District recognized that not only could this planning process meet the requirements of the AgWQM Act, it could also address the issues associated with the federal Clean Water Act and Endangered Species Act. The District encourages landowners to begin an individual conservation planning process that will improve the quality of their resources while meeting the intent of these state and federal regulations.

## Goals, Objectives, and Strategies

The Yamhill and Polk Districts work with landowners, operators or occupiers, agribusiness, commodity and volunteer organizations, and other agencies to implement this Plan. The focus of this Plan is on encouraging good stewardship of natural resources. The success of the Plan depends upon a large percentage of landowners voluntarily using conservation measures that reduce pollution from agricultural lands.

### Goal 1: Education

**Create a high level of awareness and understanding of water quality issues in the agribusiness community, rural landowners, and the public.**

#### Objectives and Strategies:

Conduct education programs to promote public awareness of water quality issues.

- Hold workshops on water quality issues and the conservation practices that will help improve water quality.
- Develop demonstration projects to showcase successful conservation practices and systems.
- Organize tours of demonstration projects for agricultural managers, and producers.
- Produce and distribute brochures about water quality issues.
- Include updates on the status of the Yamhill River Basin AgWQM Area Plan and water quality data in the Yamhill District newsletters.
- Provide information about ways in which impoundments may benefit water quality.

Conduct a media program to inform Yamhill Basin agricultural operators, rural landowners, and the public of conservation issues and events.

- Submit news articles and public service announcements to area newspapers, radio stations, and newsletters.
- Invite media to conservation tours and workshops.

Involve the agricultural community in conservation education.

- Create and maintain a list of experienced agricultural operators willing to share their conservation practices with other interested people by speaking, leading tours, and providing tour sites.

Build partnerships with agribusiness to promote conservation.

- Co-sponsor workshops and tours between the Districts and agribusinesses.
- Share education materials with agribusiness field representatives.

- Develop educational materials in conjunction with agribusinesses and commodity and volunteer organizations.

The Yamhill and Polk Districts will coordinate the education efforts and will work with partners such as the Department, NRCS, OSU Extension Service, Yamhill Basin Council, agribusiness partners, and other interested parties to carry out these education strategies. The focus of the educational effort will be on:

- Water Quality Improvement
- Conservation planning
- Prevention of agricultural water pollution
- Watershed restoration and enhancement
- Water quality conditions
- Available programs and project funds
- Conservation success stories
- Regulations related to water quality

For a list of agencies and organizations to contact for more information about resource management, please refer to Appendix C: Educational and Technical Services for Natural Resource and Farm Management.

## **Goal 2: Conservation Planning and Conservation Practices**

**Increase the adoption of conservation practices to improve water quality.**

### **Objectives and Strategies:**

Encourage agricultural producers to develop conservation plans and implement conservation practices.

- Promote the benefits of having an individual farm conservation plan that incorporates conservation practices.
- Provide assistance in planning and implementation from the Districts, NRCS, and partner organizations.
- Showcase positive and effective conservation practices through workshops and tours of demonstration projects.

Identify conservation practices that will protect and improve water quality in the Yamhill Basin.

- Develop and distribute a list of conservation practices.
- Access ongoing research into effective conservation practices.
- Obtain practical knowledge from agricultural producers.
- Encourage a review of the current governmental policies regarding streambank protection and promote a cooperative approach to restoration work.
- Develop cooperative projects between landowners and county or state road departments to implement roadside management practices.
- Coordinate roadside seeding projects.

- Facilitate shallow water development projects that divert water from roads.

## **Conservation Planning**

Landowners, operators, and occupiers have flexibility in choosing management approaches and practices to address water quality issues on their lands. They may implement conservation systems on their own--without an approved plan -- or may submit a written conservation plan to the LMA for approval.

Voluntary conservation plans describe the management systems and schedule of conservation practices that the landowner will use to conserve soil, water, and related plant and animal resources on all or part of a farm unit. Voluntary conservation plans may be developed by landowners, operators, or occupiers, consultants, or technicians available through a district or the NRCS. An individual conservation plan should outline specific measures necessary to address the "Prevention and Control Measures" outlined in this AgWQM Area Plan. Plans are developed through a planning process that involves nine steps that are described in Appendix D. For an individual conservation plan to be approved by the LMA, it must meet the minimum requirements outlined in the Instructions and Guidelines in Appendix E. An approved voluntary conservation plan provides landowners, operators, or occupiers with limited protection against immediate enforcement actions by the Department, if violations of the prevention and control measures are found to occur on their lands. Please refer to the Enforcement section of this plan for details on limited protection.

## **Conservation Practices**

Conservation plans outline management practices and structural measures that are effective means of controlling and preventing pollution from agricultural activities. These conservation practices are specific to individual farms and are selected by the landowner depending on their cropping system or livestock operation and the topographic, environmental, and economic conditions existing at a given site. As markets, technology, and cropping systems change, the conservation practices that are most appropriate for a particular site may change as well. Landowners, operators, or occupiers should, therefore, view current conservation practices as conservation methods that are likely to change over time to reflect new technologies and management strategies.

A voluntary conservation plan outlines the conservation practices that fulfill these resource quality objectives:

### **Livestock**

- Ensure proper animal waste storage and utilization or disposal.
- Manage livestock access to streams, wetlands, and riparian areas.

### **Field and Vegetable Crop Production**

- Reduce erosion and sediment delivery from agricultural and rural land.
- Limit movement of nutrients and pesticides from agricultural lands to streams.
- Manage and conserve irrigation water.

### **Nurseries**

- Reduce erosion and sediment delivery from nurseries.
- Manage and conserve irrigation water.
- Limit movement of nutrients and pesticides from nurseries to streams.

### **Vineyards, Berries, Orchards**

- Reduce erosion and sediment delivery.
- Limit movement of nutrients and pesticides to streams.
- Manage and conserve irrigation water.

### **Streamside Areas**

- Protect and/or restore ecological functions in riparian and wetland areas to improve watershed health.
- Reduce erosion and sedimentation and provide filtering and buffering characteristics.
- Allow marginally productive or poorly drained lands in floodplains to revert to riparian or wetland status.

### **Other Management Areas – Roads, Staging Areas, and Farmsteads**

- Minimize soil erosion from access roads.
- Manage runoff and contaminants in the farmstead area.

For a list of example **conservation practices** that may be used to meet these objectives, please refer to Appendix F.

The Yamhill and Polk Districts will offer technical assistance for conservation planning and will provide guidance to producers who wish to develop their own conservation plans. The USDA and other organizations offer financial assistance for implementing conservation practices outlined in voluntary conservation plans.

For more information on voluntary conservation plans, please consult the following appendices:

- D: The Conservation Planning Process.
- E: Voluntary Conservation Plans in the Yamhill Basin: Instructions and Guidelines.
- F: Conservation Practices.

### Goal 3: Funding

**Secure adequate funding for administration and implementation of the program to achieve this plan's mission, goals, and objectives.**

#### **Objectives and Strategies:**

Obtain financial assistance for implementing conservation practices; and funding for conservation planning assistance, conservation education, and water quality monitoring.

- Submit grants to the Department, Oregon Watershed Enhancement Board, USDA, US Environmental Protection Agency, DEQ, and other agencies and private organizations.
- Submit ongoing reports of successes to granting agencies.
- Form partnerships with the agribusiness sector for additional funding.
- Promote USDA incentive based cost share programs to assist producers with conservation plan implementation.
- Pursue the feasibility of Pollution Tax Abatement Program relative to water quality.
- Coordinate this plan with existing programs to minimize costs and conflicts.

Ensure adequate administration of the Yamhill River Basin AgWQM Area Plan.

- Include implementation of the Yamhill River Basin AgWQM Area Plan in the Yamhill and Polk Districts' annual and long range work plans.

The Yamhill and Polk Districts will seek funding to implement the Yamhill River Basin AgWQM Area Plan. Funding is necessary in four main areas:

**Education** – to fund education programs such as workshops, tours, and development of published materials.

**Technical assistance** – to hire staff to work with producers through the conservation planning process.

**Financial assistance** – to provide cost-share dollars to assist producers in implementing the conservation practices outlined in their voluntary conservation plans.

**Monitoring** – to monitor and evaluate the effectiveness of the Area Plan and to evaluate how agricultural activities are impacting streams in the Yamhill Basin.

For sources of financial assistance, see Appendix G: Public Funding Sources for Landowner Assistance.

## **Goal 4: Effectiveness**

### **Monitor and evaluate the effectiveness of the Plan.**

#### **Objectives and Strategies:**

Work with the Department, DEQ, the Yamhill Basin Council, and others to establish ways to measure Plan success.

Inventory and assess baseline watershed conditions and potential sources of pollution in the Yamhill Basin.

Establish a plan for monitoring streams and surface water areas that will accurately reflect current water quality conditions.

- Use the present water quality condition of the Yamhill Basin as a baseline.
- Work with local colleges to develop a monitoring program.
- Access and evaluate surveys conducted by the Yamhill Basin Council or other agencies.
- Make monitoring results available to landowners and other public.

Document the number of individual conservation plans written, the number and percentage of acres planned in the basin, and the number of practices implemented.

Track increases in awareness of water quality issues.

- Document the number of attendees of conservation workshops and tours.
- Document the number of agribusiness partnerships produced.

Monitor violations of prevention and control measures in the Yamhill Basin.

- Document the number of complaints.
- Inventory the watershed for violations of the prevention and control measures.
- Document the Department's actions.

Monitor the availability of cost-share funds to implement conservation practices outlined in individual conservation plans.

Review and update the plan if necessary.

- Use a technical advisory committee to assist in evaluating Plan success.
- Prepare information for biennial reviews of the Yamhill River Basin AgWQM Area Plan.
- Prepare a Plan status report for and provide Plan revisions (if necessary) to the state Board of Agriculture.

# Plan Compliance

## Prevention and Control Measures

OAR 603-095-0500 to OAR 603-095-0560 provide for the following Prevention and Control Measures. While the emphasis of this Plan is on voluntary action by landowners, operators, or occupiers to control the factors affecting water quality in the Yamhill Basin, the Prevention and Control Measures are outlined as a set of minimum standards that must be met on all agricultural or rural lands. Landowners, operators, or occupiers who fail to address these Prevention and Control Measures either with or without an individual conservation plan may be subject to enforcement procedures based upon the administrative rules. Enforcement procedures are outlined in the Enforcement section of this Plan.

Because of the nature of non-point source pollution, it is difficult to assign specific quantitative measures to the factors relating to agriculture that impact water quality. Rather, this Plan outlines general conditions that must be prevented and the administrative rules provide visual methods, or indicators of non-compliance, for identifying these conditions. For ease of identification, Prevention and Control Measures and indicators of non-compliance are italicized.

For a description of the 303(d) List parameters that are impacted by these Prevention and Control Measures, please refer to Appendix B.

## Prevention and Control Measure #1 - Erosion Prevention and Sediment Control

### Issue

The goal of this prevention and control measure (PCM) is to prevent erosion on agricultural and rural lands. Erosion occurs when soil particles detach and move due to the impacts of wind and water. Eroded soil particles can carry contaminants along with them. These particles, either with or without attached contaminants, can move to waterways and create water quality problems. Soil erosion reduces the long-term productivity of farmland.

Part c) of this PCM is intended to prevent existing drainages and channels from being damaged, destabilized or otherwise eroded with excessive volumes of flow and/or high energy discharges. Ditches, culverts, and other drainage structures are designed to handle a maximum flow volume, and should not be relied upon to carry volumes of water beyond this maximum. Designed drainages also have a limit to the power (or energy) of flow they can handle without being damaged by scour or other erosion processes. Natural channels have formed in response to certain flow volumes and energies, and also cannot handle flows beyond these maximums without eroding and/or becoming unstable.

#### *OAR 603-095-0540*

*(1) Erosion prevention and sediment control:*

*(a) Landowners or occupiers shall prevent sheet and rill erosion in excess of four times the tolerable soil loss (T) leaving the property or being transported to streams.*

*(b) By January 1, 2005, landowners or occupiers shall prevent sheet and rill erosion in excess of two times the tolerable soil loss (T) leaving the property or being transported to streams.*

*(c) Sediment from sheet and rill, gully, or drainage way erosion shall not reach waters of the state.*

*(d) Indicators of non-compliance for (a) through (c) above are:*

*(A) visible soil deposition that could enter natural stream areas;*

*(B) visible sloughing from drainage ways as a result of livestock grazing, tillage, or human destruction of riparian vegetation; or*

*(C) underground drainage tile outlets either improperly installed or maintained allowing soil or bank erosion to actively occur.*

### Potentially impacted 303(d) List parameters

Sedimentation, nutrients, toxics

### Indicators of non-compliance

#### Clear non-compliance

- Visible soil deposition that enters natural stream areas.
- Visible sloughing from drainage ways as a result of livestock grazing, tillage, or the destruction of riparian vegetation by the landowner or occupier.
- Underground drainage tile outlets either improperly installed or maintained allowing soil or bank erosion to actively occur.

### **Likely non-compliance, requires further investigation**

- Sheet and rill erosion greater than “T”.
- Eroding road ditches, drainage ways, and field borders.
- A drainage way that is growing deeper or wider in response to increased flows.
- Field swales with high water flow and without crop residues, grass cover, or sediment control structures.
- Steep slopes with minimal cover.
- Sediment deposits left from flowing water that are visible away from the ditch or channel.
- Lack of vegetation in and around drainage ditch.

### **Definitions**

Waters of the state - Include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the state of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. ORS 468B.005(8).

Erosion, rill - An erosion process in which numerous small channels only several inches deep are formed and which occurs mainly on recently disturbed soils. The small channels formed by rill erosion would be obliterated by normal smoothing or tillage operations. OAR 603-095-0010(14).

Erosion, sheet - The removal of a fairly uniform layer of soil from the land surface by runoff water. OAR 603-095-0010(15).

Erosion rate, sheet, and rill - The annualized amount of soil material lost from a field or parcel of land due to sheet and rill erosion, expressed in tons of soil eroded per acre per year, and calculated according to the Universal Soil Loss Equation (USLE) or the Revised Universal Soil Loss Equation (RUSLE). OAR 603-095-0010(13).

Soil loss tolerance factor or "T" - The maximum average annual amount of soil loss from erosion, as estimated by the USLE or the RUSLE, and expressed in tons per acre per year, that is allowable on a particular soil. This represents the tons of soil (related to the specific soil series), which can be lost through erosion annually without causing significant degradation of the soil or potential for crop production. OAR 603-095-0010(44).

Filter strip - A strip or area of vegetation for removing sediment, organic matter, and other pollutants from runoff and waste water (USDA - Natural Resources Conservation Service, 1997).

### **Example Conservation Practices**

For erosion control, practices include switching from conventional tillage to no till, planting a cover crop, tiling (subsurface drainage) a field to improve water infiltration, or any practice that reduces the detachment and movement of soil.

For sediment control, practices include strip cropping, catch basins, grassed lined waterways, vegetative filter strips, and straw bales.

## Prevention and Control Measure #2 - Irrigation

### Issue

The goal of this PCM is to prevent the mobilization of potential contaminants. This PCM deals with irrigation water management. Irrigation water management is comprised of two distinct components that are equally important. The first component is the irrigation system itself: the physical means of moving water from the supply source into the crop's root zone. The type of irrigation system chosen must be appropriate for factors such as field slope, soil infiltration rates, water supply, type of crop, etc.

The second component of irrigation water management considers how the system is managed. This includes how long and how often the water is applied and how often wearable components (such as sprinkler nozzles, gaskets, hoses, etc.) are replaced or serviced. Costly or complex irrigation systems are not a guarantee of success, particularly if they are managed or maintained incorrectly.

Irrigation scheduling decisions need to be based on numerous factors, such as soil water holding capacity, soil tilth conditions, crop type, stage of growth, weather conditions, recent applications of fertilizers or other chemicals, projected harvesting dates, etc. Irrigation system capabilities (performance, uniformity, efficiency, and application rate) also need to be taken into consideration.

Irrigation monitoring to determine uniform application rates should be considered. There are numerous irrigation scheduling tools available, ranging from the very inexpensive (soil moisture by feel using a soil probe, evaporation pans), to the very expensive (neutron probes, infrared guns, satellite imagery). Naturally, some scheduling tools work better with some crops than with others.

*OAR 603-095-0540*

*(2 Landowners or occupiers shall not apply irrigation water in a manner that results in irrigation water discharge entering the waters of the state.*

*(a) Indicator of non-compliance is irrigation water discharge entering waters of the state.*

### Potentially impacted 303(d) List parameters

Nutrients, toxics, sedimentation

### Indicators of non-compliance:

#### Clear non-compliance

- Irrigation water discharge entering waters of the state.

#### Likely non-compliance, requires further investigation

- Irrigation application that creates surface runoff.
- Irrigation water applied at a rate that creates surface water turbidity.
- Irrigation water applied at a rate that results in "ponding."

- Irrigation water exiting underground tile outlets.

### **Example Conservation Practices**

Planting and irrigating crops on a contour, planting sloping field edges to grasses, installing sediment basins at field edges in swales, using irrigation soil moisture monitoring, and using drip irrigation.

## Prevention and Control Measure #3 – Waste

### Issue

The goal of this PCM is to ensure that potentially concentrated nutrients and pathogens associated with higher livestock density areas are not readily transported to waters of the state.

Producers should be aware that in addition to this PCM, other laws regulate the management of animal waste. Many livestock operations are required to have a Confined Animal Feeding Operation (CAFO) permit. Also, ORS 468B.025 prohibits activity that causes pollution of any waters of the state or places or causes to be placed any wastes in a location where such wastes are likely to escape or be carried into waters of the state by any means.

*OAR 603-095-0540*

*(3) Placement, Delivery, or Sloughing of Wastes*

*(a) Effective upon adoption of these rules;*

*(A) Except as provided in ORS 468B.050, no person conducting agricultural land management or land disturbing practices shall:*

*(i) cause pollution of any waters of the state or place or caused to be placed any wastes in a location where such wastes are likely to be carried into waters of the state.*

*(ii) Discharge any wastes into any waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.*

*(B) No person shall violate the conditions of any waste discharge permit issued pursuant to ORS 468B.050 or ORS 568.*

*(b) Indicators of non-compliance are:*

*(A) runoff flowing through areas of high livestock usage and entering waters of the state; or*

*(B) livestock waste located in drainage ditches or areas of flooding.*

### Potentially impacted 303(d) List parameters

Bacteria, nutrients, dissolved oxygen, aquatic weeds or algae, chlorophyll a, pH

### Indicators of non-compliance:

#### Clear non-compliance

- Runoff flowing through areas of high livestock usage and entering waters of the state.
- Livestock waste located in drainage ditches or areas of flooding.

#### Likely non-compliance, needs further investigation

- Animal confinement areas or waste accumulation located where there is a chance of pollutant transport to waters of the state.

## **Definitions**

Livestock - the animals described or listed in ORS 596.010 and 596.020 and includes, but is not limited to, horses, mules, jennies, jack-asses, cattle, sheep, dogs, hogs, goats, domesticated fowl, psittacines, ratites, domesticated fur-bearing animals, bison, cats, poultry, and any other vertebrate in captivity. Fish are not livestock. OAR 603-011-0250(4).

Waters of the state – As defined in ORS 468B.005(8).

## **Example Conservation Practices**

- Waste management – clean water diversions; waste collection, storage, and utilization; facilities operation and maintenance.
- Pasture management/prescribed grazing.
- Vegetative buffer strips.
- Apply manure to cropland at rates that do not exceed agronomic needs for nitrogen and phosphorus based on soil and/or tissue tests for the crop to be grown.
- Schedule timing and amounts based on expected rainfall to avoid runoff.
- Manage livestock access to streams, wetlands, and riparian areas using off-stream watering facilities, exclusion (temporary or permanent), and seasonal grazing.

## Prevention and Control Measure #4 – Nutrients

### Issue

The goal of this PCM is to limit over application of nutrients to field, vegetable, and berry crops; nurseries; vineyards; and orchards. Over application of nutrients may result in nutrient runoff and leaching into waters of the state. This may cause nuisance algal growth, high pH, bacterial growth, and a decrease in dissolved oxygen. This PCM encourages growers to adopt sound agronomic practices to guide their crop nutrient applications.

Crop nutrients are elements taken in by a plant that are essential to its growth, and which are used by the plant in the production of its food and tissue. These elements include: nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, zinc, iron, manganese, copper, boron, molybdenum, and chlorine. The two nutrients of prime concern for water quality in the Yamhill Basin are nitrogen and phosphorus. Sources of crop nutrients include irrigation water, chemical fertilizers, animal manure, compost, biosolids, and leguminous and non-leguminous crop residues.

*OAR 603-095-0540*

*(4) Effective upon rule adoption, landowners or occupiers shall prevent crop nutrient applications that result in adverse impacts to waters of the state.*

*(a) Indicators of non-compliance are:*

*(A) nutrients applied to open water; or*

*(B) visible trail of compost, ash, or bio-solids to waters of the state.*

### Potentially impacted 303(d) List parameters

Bacteria, dissolved oxygen, aquatic weeds and algae, nutrients, pH, chlorophyll a

### Indicators of non-compliance:

#### Clear non-compliance

- Nutrients applied to open water.
- Visible trail of compost, ash, or biosolids to waters of the state.

#### Likely non-compliance, requires further investigation

- Total nutrient applications that exceed currently accepted fertilizer guidelines, such as Certified Crop Advisor or OSU recommendations.

### Definitions

Waters of the state - As defined in ORS 468B.005(8).

Fertilizer - Any substance, or any combination or mixture of substances, designed for use principally as a source of plant food, in inducing increased crop yields or plant growth, or producing any physical or chemical change in the soil and shall contain five percent or more of available nitrogen, phosphorus pentoxide (phosphoric acid) or potassium oxide (potash), singly,

collectively or in combination, except hays, straws, peat and leaf mold, and unfortified animal manure. ORS 633.310(5)

### **Example Conservation Practices**

Use of currently accepted fertilizer guidelines; setting realistic yield goals; regular calibration of fertilizer application equipment; appropriate application timing; periodic soil testing and plant tissue analysis; periodic nutrient analysis of manure and/or compost products that are applied; managing irrigation to prevent nutrient loss through leaching and/or surface runoff; carefully managing nutrient applications; and accounting for “non-fertilizer” sources of nutrients such as manure, compost, biosolids, and leguminous and non-leguminous crop residues.

## Prevention and Control Measure #5 – Pesticides

### Issue

The goal of this PCM is to minimize off-site transport and maximize on-site retention of pesticide materials. Over application of pesticides can lead to runoff into waters of the state and leaching, which may result in an increase in toxics and a decrease in biological organisms in water bodies and groundwater.

Read the label. As required by ORS 634.372(2) and (4), follow label recommendations for both restricted and non-restricted use pesticides. Pesticides can have a wide range of application methods and rates depending on soil type, crop type, season, and geographic location of the crop. Rain/irrigation affects different materials different ways. For example, some pesticides require a rain/irrigation event to be activated, while others can be washed off and rendered useless during the same event. Following label guidelines (which can change over time) is not only required by federal and state of Oregon laws, but will help to insure optimum results as well.

*ORS 634.372 No Person Shall:*

*(2) As a pesticide applicator or operator, intentionally or willfully apply or use a worthless pesticide or any pesticide inconsistent with its labeling, or as a pesticide consultant or dealer, recommend or distribute such pesticides.*

*(4) Perform pesticide application activities in a faulty, careless, or negligent manner.*

### Potentially impacted 303(d) List parameters

Toxics, biological criteria

### Indicators of non-compliance:

#### Clear non-compliance

- Pesticide product applied to open water unless labeled for such use.
- No air gap or other back-siphon prevention device in use on water source used to fill spray equipment. OAR 690-215-0017.
- Improper disposal of rinse/wash water or excess spray mix.

#### Likely non-compliance, requires further investigation

- Equipment not properly calibrated.

### Definitions

Pesticide - Any substance or mixture of substances intended to be used for defoliating plants or for preventing, destroying, repelling or mitigating all insects, plant fungi, weeds, rodents, predatory animals or any other form of plant or animal life which is, or which the Department may declare to be a pest, which may infest or be detrimental to vegetation, humans, animals, or be present in any environment thereof. ORS 634.006(8)(h).

## Example Conservation Practices

- Calibrate, maintain, and correctly operate application equipment. Spray rigs need to be calibrated each time application rates or materials change. Verify that a particular rpm range/gear/tire combination provides the intended ground speed. Nozzles need to be replaced often, particularly if abrasive pesticide formulations (such as wettable powders) are used. Sprayers need to be operated in the correct pressure range (dictated by the material and nozzle combination used), to prevent excess drift to non-target areas (i.e. waters of the state).
- Limit sediment movement off of the property. Once applied, many pesticide materials attach to soil particles. If soil is moving off of the property, pesticides will accompany it.
- Adopt integrated pest management (IPM) practices. IPM promotes a diverse, multi-faceted approach to pest control. This includes variety selection, field/orchard sanitation and cultural practices, field scouting, the establishment of an economic threshold for control actions, beneficial insect release, the use of biological pesticides, and the use of chemical pesticides. While IPM does not exclude the use of chemical pesticides, it does seek to reduce their use. A reduction in chemical pesticide use reduces the chance that these materials will make contact with waters of the state.
- Establish appropriate vegetative buffer strips. Buffer strips will help to retain soil (which may have adsorbed pesticides) and prevent surface runoff (which may have dissolved pesticides) from making contact with waters of the state.
- Store and handle pesticide materials correctly. Storage and handling facilities should be secure and include a leak-proof pad with curbing for mixing and loading. An alternative to a permanent, concrete pad is to always mix pesticides in the field, frequently moving sites to prevent chemical buildup. Wash/rinse water should be directly applied to the appropriate crop. Empty liquid pesticide containers should be triple rinsed, then punctured and disposed of in an approved manner. Dry chemical bags should be emptied completely. Bundle and store paper bags until they can be disposed of in an approved manner.

## Prevention and Control Measure #6 - Chemigated Irrigation Water

### Issue

This PCM addresses the rate and concentration of chemically treated irrigation water applications to farm or rangeland. Chemicals such as pesticides and fertilizers, as dissolved product or in suspension, should be carefully applied so that they do not move off the property to other bodies of water. This could occur via surface and subsurface transport. Irrigation systems used to chemigate must have appropriate backflow prevention devices installed and properly maintained.

*OAR 603-095-0540*

*(5) Effective upon rule adoption, landowners or occupiers shall prevent the application of chemicals in combination with irrigation water that results in transport into waters of the state.  
(a) Indicator of non-compliance is chemigated water flowing into waters of the state.*

### Potentially impacted 303(d) List parameters

Nutrients, toxics, aquatic weeds or algae, dissolved oxygen, pH

### Indicators of non-compliance:

#### Clear indicator of non-compliance

- Chemigated waters flowing into waters of the state.
- Functioning back-siphon prevention device not used while chemigating. OAR 690-215-0017.

#### Likely indicator of non-compliance, requires further investigation

- Chemigated waters flowing into or ponding around wells, well pits, cisterns, or other direct conduits to groundwater.
- In areas of known or suspected shallow groundwater, chemigated water ponding and standing for extended periods of time.

### Definitions

Chemigation - The method of applying nutrients, pesticides, or both in irrigation water (National Association of Wheat Growers Foundation, 1994).

Waters of the state - As defined in ORS 468B.005(8).

### Example Conservation Practices

Irrigation water management, vegetative buffer strips, nutrient management, tailwater management, integrated pest management.

## Prevention and Control Measure #7 - Roads, Staging Areas, and Farmsteads

### Issue

This PCM is intended to address non-cropped areas that may be sources of sediment or contaminant input to streams. These include roads, staging areas, barn lots, stream crossings, and heavy use areas. Many management methods are available for constructing and maintaining roads to increase their stability and reduce erosion. A single poorly maintained road can comprise the vast majority of one farm's sediment output.

*OAR 603-095-0540*

*(6) Roadways, staging areas, farmsteads, and heavy use areas shall be constructed and maintained to prevent sediment or runoff contaminants from reaching waters of the state. All roads on agricultural lands not subject to the Oregon Forest Practices Act (OFPA) are subject to this regulation. Public roads are excluded from this prevention and control measure.*

*(a) Indicators of non-compliance are:*

*(A) surface runoff from farmsteads, roads, and staging areas that pick up contaminants and flow to waters of the state; or*

*(B) visible gully erosion in roads or staging areas.*

### Potentially impacted 303(d) List parameters

Sediment, turbidity, nutrients, toxics, dissolved oxygen

### Indicators of non-compliance:

#### Clear non-compliance

- Surface runoff from farmsteads, roads, and staging areas that pick up contaminants and flow to waters of the state.
- Visible gully erosion in roads or staging areas.

#### Likely non-compliance

- Inadequate culverts and water bars to keep runoff in natural channel.
- Pesticide and oil containers stored in the open (exposed to precipitation).

### Definitions

Waters of the state - As defined in ORS 468B.005(8).

Oregon Forest Practices Act - As defined in ORS 527.610 - 527.992.

### Example Conservation Practices

- Appropriate culvert construction and design, plant and maintain grass cover where appropriate, water bars, grading roads.

## Prevention and Control Measure #8 - Streamside Areas

### Issue

It is anticipated that this PCM will allow landowners to develop a flexible streamside area management strategy while providing:

- shade to reduce solar radiation reaching the water;
- a buffer to filter sediment, organic material, nutrients, and pesticides in surface runoff;
- native species and wildlife habitat; and
- stable streambanks.

It is also anticipated that this PCM will minimize the impact of livestock on riparian vegetation and maintain stable streambanks while ensuring livestock access to water.

A healthy streamside area provides adequate vegetation to trap sediment, prevents flood debris from depositing on fields, and protects pasture and cropland from bank erosion. Protecting vegetation along smaller streams helps reduce solar radiation reaching the water and provides wildlife habitat.

Landowners can determine the appropriate width of a streamside area through one of several methods. Some examples of how to determine the appropriate width include:

- an area extending 25 feet horizontally from the top of a streambank on each side of the stream, OR
- an area two times the height from the summer low flow level to the bankfull level, plus ten feet ( $2h + 10'$ ) on each side of the stream, OR
- the width specified in the Conservation Practice Standards for Riparian Forest Buffer or Filter Strip, listed in the Natural Resources Conservation Service - Field Office Technical Guide.

Although native vegetation affords benefits over exotic species, it is not necessarily recommended that exotic, non-invasive species be removed in order to replant an area with native plants. Native species may be more resistant to diseases and pests. Still, non-native species in the near stream area may also provide valuable shade, stabilize the streambank, and provide cover for wildlife.

#### *OAR 603-095-0540*

*(7) Landowners or occupiers shall manage streamside areas to allow the establishment, growth, and/or maintenance of vegetation appropriate to the site. Vegetation must be sufficient to provide shade and to protect the streamside area such that it maintains its integrity during high stream flow events such as those events that are reasonably expected to occur as a result of a 25 year, 24-hour storm event.*

*(a) If any agricultural activity degrades riparian vegetation, the landowner or occupier shall replant or restore the disturbed area to an adequate cover as soon as practical.*

*(b) Indicator of non-compliance is active streambank sloughing or erosion as a result of tillage, grazing, or destruction of vegetation by the landowner or occupier.*

## **Potentially impacted 303(d) List parameters**

Aquatic weeds or algae, bacteria, biological criteria, dissolved oxygen, flow modification, habitat modification, nutrients, sediment, temperature, total dissolved gas, toxics, and turbidity.

### **Indicators of non-compliance:**

#### **Clear non-compliance**

- Active streambank sloughing / erosion as a result of tillage, grazing, or destruction of vegetation by the landowner or occupier.

#### **Likely non-compliance, requires further investigation**

- Stream not protected by appropriate vegetation.

### **Example Conservation Practices**

To protect and/or restore ecological functions in riparian and wetland areas to improve watershed health:

- Control undesirable vegetation.
- Plant native trees and shrubs.
- Allow snags (dead trees) to remain standing unless safety factors indicate otherwise.
- Allow fallen trees to remain on the ground or in the stream unless removal is essential for traffic, navigation, or serious flooding reasons.
- Allow marginally productive lands in floodplains/poorly drained riparian areas to revert to riparian/wetland status.

To reduce erosion and sedimentation:

- Establish buffer zones and filter strips.
- Establish grassed waterways.
- Protect streambanks.

## **Approval of a Voluntary Conservation Plan**

An approved voluntary conservation plan affords a landowner or occupier limited protection against immediate enforcement actions by the Department if violations of the prevention and control measures are found to occur on their lands. Landowners, operators, or occupiers are encouraged to develop a voluntary conservation plan under the process and guidelines provided in Appendices D and E.

The LMA has the authority to approve voluntary conservation plans. The process of having a voluntary conservation plan approved begins with the landowner or occupier bringing the plan to the LMA for review. The LMA will decide, at one of their scheduled meetings, whether to approve the plan. If the LMA decides the plan addresses Oregon Administrative Rules (OAR) 603-95-0500 – 603-95-0560 (which are based on the prevention and control measures outlined in this Plan), it will approve the plan. If the LMA decides the plan does not adequately address OAR 603-95-0500 – 603-95-0560, it will not approve it and will provide a written explanation to the landowner or occupier who submitted the plan and a list of the deficiencies to be corrected. The LMA's decision will be recorded in the meeting minutes.

## **Resolution of Complaints**

The Department investigates complaints against landowners, operators, or occupiers who are alleged to be out of compliance with OAR 603-95-0500 through 603-095-0560. The complaint must relate to a specific site and contain a thorough description of the problem. The complaint must be filed with the Department in writing and be signed by the complainant.

The Department will determine if a violation of a prevention and control measure exists using both professional judgment and the "indicators regarding compliance" outlined for each prevention and control measure in this Plan or the Rules. Based on this determination, appropriate action will be taken by the Department to assure that the condition is remedied.

## **Enforcement Action**

The Department will use enforcement mechanisms where appropriate and necessary to gain compliance with the prevention and control measures. Any enforcement action will be pursued only when reasonable attempts at voluntary solutions have failed.

A land occupier shall be responsible for only those conditions caused by activities conducted on land managed by the landowner or occupier. Criteria do not apply to conditions resulting from unusual weather events or other exceptional circumstances that could not have been reasonably anticipated, such as fire, natural disaster, or extreme weather conditions. The Department recognizes that every farm and situation is different and will take into account each individual situation when enforcing the rules.

An approved voluntary conservation plan provides landowners, operators, or occupiers limited protection against immediate enforcement actions from the Department, if violations of the prevention and control measures are found to occur on their lands. However, the landowner or

occupier must be implementing their approved voluntary conservation plan according to the schedule outlined in the plan. If the Department determines that a violation has occurred, the landowner and/or occupier will be given time to correct the situation. A voluntary conservation plan does not guarantee that additional measures will not need to be taken to address the prevention and control measures. Refer to Appendices D and E for more information on developing an approved voluntary conservation plan. Landowners, operators, or occupiers with a voluntary conservation plan that was approved prior to the development of this AgWQM Area Plan are encouraged to have it reviewed to ensure that it meets the prevention and control measures.

If an approved voluntary conservation plan which addresses the prevention and control measures listed in this document exists for a site determined to have a violation, AND the plan is being implemented on schedule, no immediate enforcement action against the implemented elements of the plan will be taken. The landowner will be given an opportunity to modify the plan or to develop an updated implementation schedule to remedy the situation with a time frame specified by the Department. The revised plan and/or implementation schedule must be approved by the LMA.

If an approved voluntary conservation plan which addresses the prevention and control measures listed in this document does not exist for a site determined to have a violation, OR if one exists but is not being implemented according to the approved schedule, the occupier and/or landowner may be issued a Notice of Noncompliance by the Department. If a Notice of Noncompliance is issued, the occupier and/or landowner will be directed by the Department to remedy the condition under the provisions of the enforcement procedures outlined in OAR 603-090-060 through 603-090-120. Authority for any enforcement action pertaining to OAR 603-095-0500 through 603-095-0560 rests solely with the Department. If and where other governmental policies, programs, or regulations conflict with this Plan or its Rules, the Department will consult with the agency(ies) and attempt to resolve the conflict in a reasonable manner.

Implementation of this Plan began upon adoption of the administrative rules. Each prevention and control measure has an effective date of implementation. Please refer to the prevention and control measures section of this Plan to view these dates.

## **Plan Evaluation and Modification**

The progress and success of implementation efforts will be assessed through determination of necessary changes in land management systems, measurement of water quality improvement over time, and evaluation of educational techniques and technical and financial tools.

By the end of 2002, and approximately every two years following, the Department, with the cooperation and assistance of the Yamhill and Polk Districts and the Committee, will assess the progress of Plan implementation toward achievement of plan goals and objectives. These assessments will include:

- An accounting of the numbers and acreage of operations with approved voluntary conservation plans which address the prevention and control measures;
- Documentation of violations of the prevention and control measures and subsequent corrections;
- An evaluation of available current water quality monitoring data, including Oregon DEQ monitoring sites, and sources of pollution in the Yamhill Basin;
- A review of projects, demonstrations, and tours used to showcase successful management practices and systems;
- An evaluation of outreach and education programs designed to provide public awareness and understanding of water quality issues;
- An evaluation of the effectiveness of technical and financial sources available to the agricultural community.

Based on these assessments, the Department, the Districts, the Committee, and the State Board of Agriculture will consider making appropriate modifications to the Yamhill River Basin AgWQM Area Plan and/or the associated OARs.

## **Monitoring**

Evaluation of the Area Plan's success involves several types of monitoring. These are:

- Baseline condition monitoring
- Implementation monitoring
- Trend monitoring
- Effectiveness monitoring

This section describes each type of monitoring and associated activities.

## Baseline Condition and Trend Monitoring – What are current conditions and how are they changing?

Baseline condition monitoring provides a starting point for assessing water quality trends and land conditions. To evaluate the effects of the Area Plan and Rules, implementation partners must establish a picture of conditions prior to implementation.

Trend monitoring evaluates long-term changes in landscape conditions and water quality. In general, trend monitoring activities are a continuation of baseline monitoring activities. Ideally, areas selected for baseline monitoring will also be used for trend monitoring.

To assess existing water quality conditions, Oregon Department of Agriculture water quality staff review water quality data from the Oregon Department of Environmental Quality's Laboratory Analytical Storage and Retrieval (LASAR) database. In many cases, monitoring sites included in this database are adequate to track water quality in agriculturally influenced watersheds. In other cases, ODA staff may recommend additional monitoring sites that would be useful for tracking agriculture's effects on water quality.

ODA looks at all data for trends, but focuses on the parameters of concern for the specific basin.

ODA applies the following criteria to water quality data used for trend monitoring:

- 1) Monitoring stations must have at least partial influence from agricultural lands.
- 2) Data must not be older than 1985.
- 3) Data must be a continuous record of at least two years (the frequency of monitoring was not considered).
- 4) Data set ideally should include at least the following constituents:
  - a) Total Suspended Solids
  - b) Nitrate
  - c) Ammonia
  - d) E. coli or fecal coliform
  - e) Total Phosphorus or orthophosphate
  - f) Dissolved Oxygen, or Chemical Oxygen Demand/Biochemical Oxygen Demand
  - g) pH

The above constituents are considered needed for tracking changes in water quality related to agricultural activities. Temperature is not included on this list because it is continuously monitored, rather than periodically like the parameters above, and because ODA expects changes in temperature to take place more slowly with changes in land conditions.

### ***LASAR Data Summary***

A total of 16 monitoring stations were found in the LASAR database that met our criteria. However, ten of these did not have data beyond 1988, and all but two did not have continuous data past 2001. The South Yamhill at Hwy 99 and North Yamhill at Poverty Bend Road are the only stations listed with continuous data that may be used for future trend monitoring.

The other stations with relevant data are on the North Yamhill, Mill Creek, Deer Creek, Salt Creek, the mainstem Yamhill River, and Willamina Creek. It would be useful to establish at least one other long-term monitoring station in the Yamhill Basin. A useful location would be in Ash Swale near Patty Lane, which would provide more information on water quality in the south and southeastern parts of the basin.

As of May 2007, the water quality data for the South Yamhill River at Highway 99 site shows a slightly increasing trend in nitrate concentrations (for the time period 1996 through 2006). Data over this period shows a maximum N as nitrate concentration of 1.47 mg/l. The mean concentration was 0.40 mg/l. Though this concentration does not exceed drinking water standards, it is still too high for natural water. As of September 2009, water quality data for the South Yamhill River site no longer showed an increasing trend in nitrate.

As of October 2007, the North Yamhill at Poverty Bend Road showed sporadic problems with E. coli and turbidity, though no trends were apparent. No other analytes assessed has excessive concentrations, except turbidity. One high turbidity value of 79 was reported on December 29, 2008. This was most likely the result of a large storm event or rain-on-snow event, because it also produced elevated turbidity at the North Yamhill River monitoring site. This site had a turbidity of 66 on that date, along with elevated nitrate (2.26 mg/l) and total phosphorus (0.18 mg/l) concentrations. High nitrate and TP concentrations were also reported at this site on February 24, 2009. Four high E. coli counts were also reported on the North Yamhill River after October, 2007.

#### ***Yamhill Basin Council Water Quality Monitoring Update (October 2009)***

Water quality in the Yamhill River and Chehalem Creek watersheds is influenced by both human activity and natural processes. In this region, a healthy water supply is vital to supporting domestic and industrial water usage, fish and wildlife, irrigation, recreation, and livestock watering. Water quality is affected by a number of factors in the Yamhill Basin, including land use practices associated with urbanization, agriculture, and forest management. Human activities in our watersheds have decreased water quality, reduced habitat diversity for wildlife and sent populations of some aquatic species into decline. The Oregon Department of Environmental Quality (DEQ) has placed several area streams on their 303(d) list, indicating that they are impaired.

The majority of water quality monitoring in the Yamhill River watershed has been conducted in the Coast Range, on lands managed by the federal government (Bureau of Land Management), the Confederated Tribes of Grand Ronde, and private industrial timber landowners. The McMinnville Water Reclamation Facility tests water quality on the South Yamhill River, upstream and downstream from the treatment plant.

In 1998, with the cooperation of private and public landowners, the Yamhill Basin Council (YBC) began to monitor stream temperature at a number of sites throughout the region. The purpose of this program was to collect baseline data on stream temperatures in areas not monitored by other parties.

In 2002, in accordance with the Council's action plan, the YBC decided to pursue monitoring additional water quality parameters to increase local knowledge of stream conditions. The YBC applied for a grant from the Oregon Watershed Enhancement Board and secured funding to monitor new parameters at sites throughout the basin in 2003 and 2004. The Yamhill Basin Water Quality Project was initiated in the summer of 2003 at 25 sites. In 2004, monitoring continued at a subset of the 2003 sites.

Chemical, biological, and physical stream parameters were sampled and measured. Parameters tested included temperature, dissolved oxygen (DO), pH, conductivity, turbidity, *E. coli*, and benthic macro invertebrates (aquatic insects, a good indicator of water quality). The full report can be found on the YBC website ([www.co.yamhill.or.us/ybc](http://www.co.yamhill.or.us/ybc)).

Following its work on the Yamhill River and tributaries, the YBC completed baseline water quality monitoring of the North Yamhill River and tributaries. Data collection took place in 2005 and 2006, and the YBC completed its final monitoring report documenting 2005 and 2006 results. The Council and its members monitored 17 sites along the North Yamhill River, Turner Creek, Yamhill Creek, Panther Creek, and Baker Creek. Data show that all sites but one on Baker Creek violate the stream temperature standard and most sites violated the dissolved oxygen and turbidity standards.

This baseline data will help the YBC and partners, such as the Yamhill SWCD, determine where best to focus efforts to improve water quality as well as fish and wildlife habitat. In addition, by collecting water quality data over several years, we may be able to determine which conservation practices provide the greatest benefit for water quality.

The Yamhill Basin Council has taken the lead with respect to monitoring stream conditions in the watershed. They have conducted stream temperature monitoring since 1998 and began collecting other parameters on 18 streams during 2003. The results of the 2003 - 2004 monitoring have been published along with the results from the 2005-2006 North Yamhill study. Considering all these data sets, we have a significant baseline survey of the entire watershed. Thirteen of all the monitoring stations showed excessive concentrations of *E. coli* and/or fecal coliform. Thirteen streams did not meet DO standards. Fifteen did not meet turbidity standards. Salt Creek at Whiteson has had elevated nitrate (N) concentrations, though two upstream monitoring stations have not had elevated N. Other streams with multiple sampling locations also show differences in water quality over distinct reaches.

While the 2008/2009 Lower South Yamhill study is currently underway, preliminary results indicate significant *E. coli* concerns, especially on Cozine Creek and Ash Swale. Flow during summer months is relatively non-existent on Ash Swale, Palmer Creek, and Salt Creek near the mouth where measurements are taken. Duckweed covers many of the sites during the summer months. Turbidity has been an issue on Palmer Creek near Hopewell, and is currently being investigated by ODA. Dissolved oxygen is severely impaired on Salt Creek, especially near the mouth. Analysis of results and a complete report will be available early in 2010. Data can be available earlier upon request.

## **Effectiveness monitoring – Are efforts protecting and improving water quality?**

Effectiveness monitoring occurs at two scales. At a Management Area scale, land management, land condition, and water quality data are compared to determine if changes in land conditions are improving water quality in relation to beneficial uses. At a farm scale, ODA and local partners have initiated several projects to evaluate the effects of several management practices on water quality.

Currently, ODA is focusing land condition monitoring efforts on riparian areas because these areas have such an influence over water quality. Riparian land conditions are evaluated every five years by analyzing aerial photographs of about 5 percent of the riparian agricultural land. ODA staff examine riparian ground cover at specific points in 90-foot bands along the stream from the aerial photos and assign each sample stream reach a score based on ground cover. The score can theoretically range from 70 (all trees) to 0 (all bare ground). Staff will then compare that score with the score when photos are taken again in five years to track changes in riparian conditions over time. Because site conditions vary across the state, there is no one correct riparian index score. Results of the 2008 landscape monitoring showed there was little difference from the initial 2003 monitoring. The six Yamhill streams analyzed for this report all showed tree and shrub densities of at least 65 percent within thirty feet of the stream, with most streams (except Berry Creek) having tree and shrub densities in excess of 80 percent.

### ***Department of Environmental Quality (DEQ), Oregon Water Quality Index (OWQI) Yamhill Basin Summary***

The OWQI analyzes a defined set of water quality variables and produces a score describing general water quality. The water quality variables included in the OWQI are temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogens, total phosphorus, and bacteria (*E. coli*). There are three sites in the Yamhill Basin with sufficient data for water quality trending analysis, based on OWQI scores. The locations are, 1) North Yamhill River at Poverty Bend Road, 2) South Yamhill River at Highway 99, and 3) Yamhill River at Dayton. DEQ analyzes data for trends over ten-year periods.

Analysis of the data from the three Yamhill Basin sites shows a significantly increasing trend in water quality at the Yamhill River at Dayton site between 1986 and 1995 and at all three sites between 1992 and 2001. An increasing trend in water quality continued at the North Yamhill site between 1994 and 2003 followed by a decreasing trend between 1998 and 2007. Analyses of 10-year periods ending after 2001 do not show increasing or decreasing water quality trends at the South Yamhill or Yamhill River sites.

## **Implementation Monitoring – What is being accomplished**

Implementation monitoring tracks the conservation practices that have been implemented to benefit water quality. The local Soil and Water Conservation District and Natural Resources Conservation Service track practices that have been implemented through quarterly reports to the Oregon Department of Agriculture and through an NRCS database. In addition, projects that have received funding from the Oregon Watershed Enhancement Board are tracked in OWEB's

restoration database. The biennial report from the Local Advisory Committee has an attachment with details regarding the implemented projects.

## References

- Economics and Statistics Administration and Bureau of the Census. 1993. Census of Agriculture 1992, Volume 1: Geographic Area Series, Part 37: Oregon (State and County Data). US Department of Commerce, Washington, D.C.
- Gabriel, J. T. 1993. A modified synoptic analysis of the status of Oregon's Willamette Valley wetlands. Master's Degree Research Paper. Department of Geosciences, Oregon State University, Corvallis.
- Galovich, Gary. 1999. Personal Communication. August 16, 1999. Oregon Department of Fish and Wildlife.
- Knezevich, C. A. 1982. Soil Survey of Polk County, Oregon. United States Department of Agriculture-Soil Conservation Service, Washington, D.C.
- National Agricultural Statistics Service and Oregon Department of Agriculture. 1998. Oregon Agriculture & Fisheries Statistics 1997 – 1998. (V.G. Korn, ed.). USDA Oregon Agricultural Statistics Service, Salem.
- National Association of Wheat Growers Foundation and Kansas State University Cooperative Extension. 1994. Best Management Practices for Wheat. (Steve Watson, ed.) National Association of Wheat Growers Foundation, Washington, D.C.
- Oregon Department of Administrative Services, 2007. Oregon Department of Administrative Services, Office of Economic Analysis. Accessed on-line September 10, 2007 from the DAS OEA website at <http://www.oregon.gov/DAS/OEA/demographic.shtml>
- Oregon State University Extension. 1998. Yamhill County Estimate of Agricultural Commodity Sales. Oregon State University Extension Service, McMinnville, Oregon.
- Oregon Water Resources Department. 1998. Water Rights Information System.
- Otte, G. E., D. K. Setness, W. A. Anderson, F. J. Herbert, Jr., and C. A. Knezevich. 1974. Soil Survey of Yamhill Area, Oregon. United States Department of Agriculture-Soil Conservation Service, Washington, D.C.
- US Census Bureau, 2007. Accessed on-line September 10, 2007 from the US Census Bureau website at [http://factfinder.census.gov/servlet/SAFFPopulation?\\_event=Search&\\_name=Yamhill+County&\\_state=04000US41&\\_county=Yamhill+County&\\_cityTown=Yamhill+County&\\_zip=&\\_sse=on&\\_lang=en&pctxt=fph](http://factfinder.census.gov/servlet/SAFFPopulation?_event=Search&_name=Yamhill+County&_state=04000US41&_county=Yamhill+County&_cityTown=Yamhill+County&_zip=&_sse=on&_lang=en&pctxt=fph)
- USDA – National Agricultural Statistics Service, 1997. “1997 Census of Agriculture: Oregon, State and County Data” Volume 1, Geographic Area Series Part 37.

USDA - Natural Resources Conservation Service. 1997. Field Office Technical Guide (FOTG) Section IV - Practice Standards and Specifications. Natural Resources Conservation Service, Oregon.

Wynea, Bob. 1999. Personal Communication. April 27, 1999. Willamette Valley Llama Association.

# Appendices

- A. Waterbodies with an approved TMDL and waterbodies on the 2004/2006 303(d) list**
- B. 303(d) List Parameters**
- C. Educational and Technical Services for Natural Resource and Farm Management**
- D. The Conservation Planning Process**
- E. Instructions and Guidelines for a Voluntary Conservation Plan**
- F. Conservation Practices**
- G. Public Funding Sources for Landowner Assistance**

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**Appendix A: Waterbodies with an approved TMDL and waterbodies listed on the 2004/2006 303(d) list**

<b>Waterbody</b>	<b>River Mile</b>	<b>Parameter</b>	<b>Season</b>	<b>Status</b>	<b>Date</b>
<b>TMDL Approved</b>					
Deer Creek	0 to 20.4	Phosphorus	May 1 – October 31	TMDL Approved	1998
Mill Creek	0 to 22.2	Phosphorus	May 1 – Oct 31	TMDL approved	1998
N. Yamhill River	0 to 20.1	Phosphorus	May 1 – October 31	TMDL approved	1998
Salt Creek	0 to 32.8	Phosphorus	May 1 – October 31	TMDL approved	1998
S. Yamhill River	0 to 61.7	Phosphorus	May 1 – October 31	TMDL approved	1998
Willamina Creek	0 to 20.8	Phosphorus	May 1 – October 31	TMDL approved	1998
Yamhill River	0 to 11.2	Chlorophyll a	Year round	TMDL approved	2004
Yamhill River	0 to 11.2	Phosphorus	May 1 – October 31	TMDL approved	1998
Yamhill River	0 to 11.2	pH	May 1 – October 31	TMDL approved	1998
<b>Waterbody</b>	<b>River Mile</b>	<b>Parameter</b>	<b>Season</b>	<b>Status</b>	<b>Date</b>
<b>303 (d) List</b>					
Baker Creek	0 to 14.2	Temperature	Summer	303 (d) list	2002
Cedar Creek	0 to 2.3	Iron	Year-round	303 (d) list	2002
Chehalem Creek Tributary	0 to 4.3	Temperature	Year-round	303 (d) list	2004
Deer Creek	0 to 12	Temperature	Summer	303 (d) list	1998
Deer Creek	0 to 20.4	Fecal Coliform	Fall/Winter/Spring Summer	303 (d) list	1998
Mill Creek	0 to 22.2	Fecal Coliform	Summer	303 (d) list	1998
Mill Creek	0 to 17	Temperature	Summer	303 (d) list	2002
N. Yamhill River	0 to 20.1 20.1 to 32.4	Temperature	Summer	303 (d) list	1998
N. Yamhill River	0 to 20.1	Fecal Coliform	Fall/Winter/Spring	303 (d) list	1998
N. Yamhill River	0 to 20.1	Dissolved Oxygen	Jan 1 to May 15	303 (d) list	2004
N. Yamhill River	0 to 32.5	Iron Manganese	Year-round	303 (d) list	2004
N. Yamhill River	0 to 20.1	E Coli	Fall/Winter/Spring	303 (d) list	2004
Panther Creek	0 to 14	Temperature	Summer	303 (d) list	2002
Salt Creek	0 to 32.8	Manganese	Year-round	303 (d) list	2002
Salt Creek	0 to 32.8	Temperature	Summer	303 (d) list	1998

Salt Creek	0 to 32.8	Fecal Coliform	Fall/Winter/ Spring	303 (d) list	1998
Salt Creek	0 to 32.8	Dissolved Oxygen	Spring/ Summer/Fall	303 (d) list	1998
Salt Creek	0 to 32.8	Chlorophyll a	Summer	303 (d) list	1998
S. Yamhill River	42.6 to 61.7	Fecal Coliform	Summer	303 (d) list	1998
S. Yamhill River	18.1 to 42.6	Temperature	Summer	303 (d) list	1998
S. Yamhill River	18.1 to 42.6	Fecal Coliform	Year-round	303 (d) list	1998
S. Yamhill River	0 to 18.1	Temperature	Summer	303 (d) list	1998
S. Yamhill River	0 to 18.1	Iron	Year-round	303 (d) list	2002
S. Yamhill River	0 to 40.1	Dissolved Oxygen	January 1 – May 15	303 (d) list	2004
Turner Creek	0 to 2.5	Temperature	Summer	303 (d) list	1998
W. Fork Palmer Cr	0 to 5.2	Chlorpyrifos	Year-round	303 (d) list	1998
Willamina Creek	0 to 9.9	Fecal Coliform	Fall/Winter/S pring	303 (d) list	1998
Yamhill River	0 to 11.2	Dissolved Oxygen	January 1 to May 15	303 (d) list	2004
Yamhill River	0 to 11.2	E Coli	Fall/Winter/ Spring	303 (d) list	2004
Yamhill River	0 to 11.2	Fecal Coliform	Fall/Winter/S pring	303 (d) list	1998
Yamhill River	0 to 11.2	Iron	Year-round	303 (d) list	2002
Yamhill River	0 to 11.2	Manganese	Year-round	303 (d) list	2002
Yamhill River	0 to 11.2	Temperature	Summer	303 (d) list	2004

## **Appendix B: 303(d) List Parameters**

The following is a list of parameters used by the DEQ in establishing the 303(d) List and assessing waterbodies. This is an abbreviated summary and does not contain detailed descriptions of the parameters and associated standards. Specific information about these parameters and standards can be found at <http://www.deq.state.or.us/wq/assessment/assessment.htm> or by calling (503) 229-6099 for more information about DEQ's Integrated Report and 303(d) list.

### **Parameters**

#### **Aquatic Weeds or Algae**

Standard – The development of fungi or other growths having a deleterious effect on stream bottoms, fish, or other aquatic life, or which are injurious to health, recreation, or industry shall not be allowed.

Beneficial Uses Affected - Water Contact Recreation, Aesthetics, Fishing

#### **Bacteria (Escherichia coli) or Water Contact Recreation (Fecal Coliform)**

Beneficial Uses Affected - Water Contact Recreation

#### **Biological Criteria**

Standard – Waters of the state shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

Beneficial Uses Affected - Resident Fish and Aquatic Life

#### **Chlorophyll a**

Standard – The following average Chlorophyll a values shall be used to identify water bodies where phytoplankton may impair the recognized beneficial uses:

Natural lakes, which thermally stratify: 0.01 mg/l

Natural lakes, which do not thermally stratify, reservoirs, rivers, and estuaries: 0.015 mg/l

Beneficial Uses Affected - Water Contact Recreation, Aesthetics, Fishing, Water Supply, Livestock Watering

#### **Dissolved Oxygen**

Beneficial Uses Affected - Resident Fish and Aquatic Life, Salmonid Spawning & Rearing

#### **Flow Modification**

Standard – The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish shall not be allowed.

Beneficial Uses Affected - Resident Fish & Aquatic Life, Salmonid Fish Spawning & Rearing

**Habitat Modification**

Standard – The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish shall not be allowed.

Beneficial Uses Affected - Resident Fish & Aquatic Life, Salmonid Fish Spawning & Rearing

**Nutrients (e.g. phosphorus, phosphate, Chlorophyll)**

Beneficial Uses Affected - Aesthetics or use identified under related parameters

**pH**

Beneficial Uses Affected - Resident Fish & Aquatic Life, Water Contact Recreation

**Sedimentation**

Standard – The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry shall not be allowed.

Beneficial Uses Affected - Resident Fish & Aquatic Life, Salmonid Fish Spawning & Rearing

**Temperature**

Beneficial Uses Affected - Resident Fish & Aquatic Life, Salmonid Fish Spawning & Rearing

**Total Dissolved Gas**

Standard – The concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed 110 percent of saturation, and the liberation of dissolved gases, such as carbon dioxide, hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation or other reasonable uses made of such waters shall not be allowed.

Beneficial Uses Affected - Resident Fish and Aquatic Life

**Toxics ( e.g. metals, ammonia)**

Beneficial Uses Affected - Resident Fish and Aquatic Life, Drinking Water

**Turbidity**

Standard – No more than ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activities.

Beneficial Uses Affected - Resident fish and Aquatic Life, Water Supply, Aesthetics

## **Appendix C: Educational and Technical Guidance Information for Natural Resource and Farm Management**

### **Soil and Water Conservation Districts (SWCDs)**

Prepares management plans and helps implement them by coordinating with other technical experts in natural resources.

#### **Yamhill SWCD**

2200 SW 2<sup>nd</sup> Street  
McMinnville, OR 97128  
Phone: (503) 472-1474 ext. 3 Fax: (503) 472-2459  
[www.yamhillswcd.org](http://www.yamhillswcd.org)

#### **Polk SWCD**

580 Main Street  
Dallas, OR 97338  
Phone: (503) 623- 9680 ext. 101 Fax: (503) 623-3489

### **USDA – Natural Resources Conservation Service (NRCS)**

Provides information on soil types, soils mapping, and interpretation of Field Office Technical Guide (FOTG). Administers and provides assistance in developing plans for Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP), Wetlands Reserve Program (WRP), and other cost share programs. Makes technical determinations on wetlands and highly-erodible land.

#### **NRCS Main Office**

1201 NE Lloyd Blvd, Suite 900  
Portland, OR 97232  
Phone: (503) 414-3200  
Fax (503) 414-3103  
<http://www.or.nrcs.usda.gov/>

#### **NRCS Yamhill Office**

2200 SW 2<sup>nd</sup> Street  
McMinnville, OR 97128  
Phone: (503) 472-1474

#### **NRCS Polk Office**

580 Main Street, Suite A  
Dallas, OR 97338-1911  
Phone: (503) 623-5534

**Oregon State University Extension Service**

Offers educational programs, seminars, classes, tours, and publications to guide landowners in managing their resources.

**OSU Extension Yamhill County Office**

2050 Lafayette Street  
McMinnville, OR 97128  
Phone: (503) 434-7517  
<http://extension.oregonstate.edu/yamhill/>

**OSU Extension Polk County Office**

182 SW Academy, Suite 222  
Dallas, OR 97338  
Phone: (503) 623-8395  
<http://extension.oregonstate.edu/polk/>

**Oregon Department of Agriculture (ODA)**

Oversees the Agricultural Water Quality program, issues permits and helps producers comply with confined animal feeding water management programs, provides support to Soil and Water Conservation Districts.

**ODA Main Office**

635 Capitol St. NE  
Salem, OR 97301-2532  
Phone: (503) 986-4550  
<http://www.oregon.gov/ODA>

**Pesticides Division**

Phone: (503) 986-4635 Fax: (503) 986-4735  
<http://www.oregon.gov/ODA/PEST>

**Natural Resources Division**

Phone: (503) 986-4700 Fax: (503) 986-4730  
<http://www.oregon.gov/ODA/NRD>

**Plant Division (pests, weeds, etc.)**

Nursery & Christmas Trees Program, Phone: (503) 986-4644  
Plant Pest & Disease Programs, Phone: (503) 986-4636  
Noxious Weed Control Program, Phone: (503) 986-4621  
Invasive Species Hotline, Phone: 1-866-INVADER  
<http://www.oregon.gov/ODA/PLANT>

**Department of Environmental Quality (DEQ)**

Responsible for protecting and enhancing Oregon's water and air quality, cleaning up spills and releases of hazardous materials, and managing the proper disposal of solid and hazardous wastes. Maintains a list of water quality limited streams, sets TMDL allocations.

**DEQ Main Office**

811 SW Sixth Avenue  
Portland, OR 97204-1390  
Phone: (503) 229-5696 or (800) 452-4011  
TTY: (503) 229-6993 Fax: (503) 229-6124  
E-mail: [deq.info@deq.state.or.us](mailto:deq.info@deq.state.or.us)  
<http://www.deq.state.or.us/>

**USDA – Farm Service Agency (FSA)**

Maintains agricultural program records and administers various cost share programs. Their offices also provide up-to-date aerial photography of farm and forestland.

**Yamhill County Office**

2200 SW 2<sup>nd</sup> Street  
McMinnville, OR 97128  
Phone: (503) 472-1474 ext. 2

**Polk County Office**

580 Main Street  
Dallas, OR 97338  
Phone: (503) 623-2396 ext. 2

**Department of State Lands (DSL)**

Administers state removal/fill law and provides technical assistance.

**DSL Main Office**

775 Summer St. N.E., Suite 100  
Salem, OR 97301-1279  
Phone: (503) 986-5200 Fax: (503) 378-4844  
<http://www.oregon.gov/DSL>

**Oregon Water Resources Department (WRD)**

Provides technical and educational assistance and water rights permits and information.

**WRD Main Office**

725 Summer St. NE, Suite A  
Salem, OR 97301  
Phone: (503) 986-0900 Fax: (503) 986-0904  
<http://www.oregon.gov/WRD>

**Yamhill Basin Council**

Brings diverse interests together to work towards solutions on local natural resource issues. Collects environmental data about the watershed and conducts education and volunteer programs.

**Yamhill Basin Council Main Office**

2200 SW 2<sup>nd</sup> Street  
McMinnville, OR 97128  
Phone: (503) 474-1047 Fax: (503) 472-2459  
<http://www.co.yamhill.or.us/ybc/>

**Yamhill Basin Local Advisory Committee (LAC)**

Voluntary committee composed of twelve agricultural producers in the Yamhill Basin. Charged with developing the agricultural water quality management area plan in accordance with the AgWQM Act.

**Yamhill SWCD District Manager**

2200 SW 2<sup>nd</sup> Street  
McMinnville, OR 97128  
Phone: (503) 472-1474 ext. 3 Fax: (503) 472-2459  
<http://www.yamhillswcd.org>

**Oregon Department of Fish and Wildlife (ODFW)**

Works with landowners to balance protection of fish and wildlife with economic, social, and recreational needs. Advises on habitat protection. Offers technical and educational assistance for habitat and restoration projects. Provides plan review for special property tax assessment for wildlife habitat projects.

**ODFW Main Office**

3406 Cherry Ave NE  
Salem, OR 97303  
Phone: (503) 947-6000  
<http://www.oregon.gov/ODFW>

**ODFW North Willamette Watershed District**

Phone: (503) 657-2000

**Oregon Department of Forestry (ODF)**

Technical assistance with State and Federal cost sharing, Oregon property tax programs, Forest Resource Trust, forestry practices, and forest management plans.

**ODF Main Office**

2600 State Street  
Salem, Oregon 97310

Phone: (503) 945-7200 Fax: (503) 945-7212  
TTY: 800-437-4490  
<http://www.oregon.gov/ODF>

**ODF Dallas Office**

Phone: (503) 623-8146

**ODF Forest Grove Office**

Phone: (503) 357-2191

**Yamhill County Government**

Provides information on county zoning and restrictions.

**Department of Planning and Development (zoning)**

401 N.E. Evans Street

McMinnville, Oregon 97128

Phone: (503) 434-7516 Fax: (503) 434-7544

E-mail: [planning@co.yamhill.or.us](mailto:planning@co.yamhill.or.us)

<http://www.co.yamhill.or.us/plan>

**Public Works (roads, bridges, culverts, etc.)**

2060 Lafayette Avenue

McMinnville, OR 97128

Phone: (503) 434-7515 Fax: (503) 472-4068

E-mail: [pubwork@co.yamhill.or.us](mailto:pubwork@co.yamhill.or.us)

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## **Appendix D: The Conservation Planning Process**

The USDA - Natural Resources Conservation Service and the Soil and Water Conservation Districts use the following nine-step process to develop a voluntary conservation plan.

- 1 Identify Problems -- Identify resource problems, opportunities, and concerns in the planning area.
- 2 Determine Objectives -- Identify, agree on, and document the client's objectives.
- 3 Inventory Resources -- Inventory the natural resources and their condition, and the economic and social considerations. This includes on-site and related off-site conditions.
- 4 Analyze Resource Data -- Analyze the resource information gathered in planning step 3 to clearly define the natural resource conditions, along with economic and social issues. This includes problems and opportunities.
- 5 Formulate Alternatives -- Formulate alternatives that will achieve the client's objectives, solve natural resource problems, and take advantage of opportunities to improve or protect resource conditions.
- 6 Evaluate Alternatives -- Evaluate the alternatives to determine their effects in addressing the client's objectives and the natural resource problems and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law or Executive Order.
- 7 Make Decisions -- The client selects the alternative(s) and works with the planner to schedule conservation system and practice implementation. The planner prepares the necessary documentation.
- 8 Implement the Plan -- Implement the selected alternative(s). The planner provides encouragement to the client for continued implementation.
- 9 Evaluate Plan -- Evaluate the effectiveness of the plan as it is implemented and make adjustments as needed.

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## **Appendix E: Instructions and Guidelines for a Voluntary Conservation Plan**

To comply with the Agricultural Water Quality Management Act, a landowner or occupier needs to ensure that no violations of the "prevention and control measures" outlined in the administrative rules OAR 603-095-0500 through 603-095-0560 occur on their property. A landowner or occupier is NOT required to have a voluntary conservation plan. The Yamhill and Polk Districts do, however, promote the conservation planning process as the best method for landowners to use to improve the health of their resources and ensure that they are addressing all pertinent prevention and control measures.

A landowner who develops a voluntary conservation plan may choose to get it approved by the LMA. If the plan is approved by the LMA and is being followed according to its schedule, it affords the landowner or occupier with limited protection from immediate enforcement action from the Department should a prevention and control measure be violated on their land. These guidelines and instructions define the elements that must be included in a voluntary conservation plan in order for it to be approved by the LMA.

The plan needs to address all of the prevention and control measures written in the Yamhill River Basin AgWQM Area Plan and provide an action strategy for the improvement of those resources that are a part of the landowner's management objectives. The signature page (included) must be signed by the landowner, resource professional preparing the plan, and the LMA.

Landowners with a voluntary conservation plan that was approved prior to the development of this AgWQM Area Plan are encouraged to have it reviewed to ensure that it meets the prevention and control measures.

## **Management Plan Instructions:**

1. Cover Page  
List the landowner's name and address, location of the property described in the plan; the name, address, title and phone number of the person completing the plan; and the date the plan is completed.
2. Table of contents
3. Landowner objectives
4. Physical site description
5. Map
  - A map or maps at 8" = 1 mile or larger scale showing:
  - Legend
  - Property boundary
  - Soil types
  - Field divisions and numbers
  - Streams / ponds
  - 303(d) Listed stream segments highlighted
6. Field Inventory Data
  - Soil types
  - Acres
  - Erosion estimates
  - Crops / land use / rotations
  - Livestock enterprises
  - Forage inventories
  - Fertilizer / pesticide information
7. Conservation Practices  
Provide a narrative that describes how each prevention and control measure (PCM) is being addressed on the property. List the conservation practices that are currently being implemented or will be in the future to address the PCMs. For the plan to be approved, practices must meet the NRCS technical guidelines. Include practice specifications (if applicable) and operation and maintenance requirements.
8. Schedule  
Schedule for the implementation of the conservation practices outlined in the plan.
9. Other information  
Photos, soil tests, alternatives, or supporting data.
10. Signature Page (Included)

**For additional guidance in developing a voluntary conservation plan, an example template and plan is available from the Yamhill Soil and Water Conservation District.**

## Yamhill Basin Voluntary Conservation Plan Signature Page

This voluntary conservation plan describes the existing soil, water, animal, plant, and air resources on the property. It addresses the opportunities for the protection of all natural resources while assisting the landowner with meeting his/her objectives for the management of the property. It addresses all of the prevention and control measures written in the Yamhill River Basin Agricultural Water Quality Management Area Plan, which are in the categories of:

- Erosion Prevention and Sediment Control
- Irrigation Management
- Animal Waste
- Nutrients
- Pesticides
- Chemigated Irrigation Water
- Roads, Staging Areas, and Farmsteads
- Streamside Area Management

Prepared for:

Prepared by:

---

Landowner's Signature

Date

---

Resource Professional's Signature

Date

---

Landowner's Name (Please print)

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Resource Professional's Name (Please print)

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Approved by:

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Chair, Yamhill Basin Local Management Agency

Date

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## **Appendix F: Conservation Practices**

The following is a list of example agricultural conservation practices according to type of operation.

### **Field and Vegetable Crop Production**

#### **Reduce erosion and sediment delivery from agricultural and rural land.**

Example conservation practices:

- Residue management
- Grassed waterways
- Cover cropping
- Crop rotations
- Conservation tillage
- Vegetative buffer strips
- Straw mulch
- Jute erosion matting
- Irrigation scheduling using soil moisture instrumentation
- Sub-surface drainage - surface inlets and diversions

#### **Limit movement of nutrients and pesticides from agricultural lands to streams.**

Example conservation practices:

- Vegetative buffer strips
- Irrigation water management
- Equipment calibration and maintenance
- Tailwater management
- Integrated pest management
- Proper storage of pesticides, fertilizer, and fuel

#### **Manage and conserve irrigation water.**

Example conservation practices:

- Irrigation scheduling based on site specific factors that influence crop growth, such as:
  - evapotranspirational demands (crop type, stage of growth, percent ground shade, weather conditions)
  - soil conditions (percolation rate, water holding capacity)
  - irrigation system performance (uniformity, efficiency, and application rate)
  - recent applications of crop nutrients or farm chemicals
- Irrigation scheduling using:
  - soil probes
  - evaporation pans
  - neutron probes
  - infrared guns
  - tensiometers
  - other soil water monitoring devices
- Contour cropping

## **Livestock**

### **Ensure proper animal waste storage and utilization or disposal.**

Example conservation practices:

- Vegetative buffer strips.
- Cover manure piles with a tarp.
- Manure storage and composting structures.
- Waste management – clean water diversions; waste collection, storage, and utilization; facilities operation and maintenance.
- Apply manure to cropland at rates that do not exceed agronomic needs for nitrogen and phosphorus based on soil and/or tissue tests for the crop to be grown.
- Pasture management/prescribed grazing.

### **Manage livestock access to streams, wetlands, and riparian areas.**

Example conservation practices:

- Off-stream watering
- Seasonal grazing
- Exclusion – temporary or permanent

## **Nurseries**

### **Reduce erosion and sediment delivery from nurseries.**

Example conservation practices:

- Use ground cloth and/or gravel in container nurseries as a surface covering.
- Gravel or sod road surfaces and staging areas.
- Designed drainage systems to handle runoff from greenhouse and building roofs.
- Grass ditches, waterways, and buffer strips adjacent to streams and ponds.
- Land leveling.
- Limit irrigation runoff from fields.
- Manage cultivation timing and methods.

### **Manage and conserve irrigation water.**

Example conservation practices:

- Recycling of irrigation tail water in container nurseries.
- Moisture monitoring to determine field moisture to balance irrigation applications with crop needs.
- Monitor and record water use.
- Regular maintenance of irrigation delivery systems for maximum efficiency.
- Utilize cultivation to conserve soil moisture in field operations.

### **Limit movement of nutrients and pesticides from nurseries to streams.**

Example conservation practices:

- Apply fertilizer based on competent advice and nutrient levels determined by soil and tissue analysis.
- Time fertilizer applications to promote optimum plant utilization and limit leaching.

- Protect water sources from contamination through use of backflow prevention devices where fertigation is practiced.
- Restrict irrigation water from leaving the property through irrigation management and water recycling.
- Make banded fertilizer application when feasible.
- Calibrate application machinery prior to use.
- Monitor and record application rates.
- Use timed release fertilizers.
- Maintain organic content of soil mixes and fields to hold nutrients for plant utilization.
- Utilize Integrated Pest Management (IPM) practices.
- Scout crops to determine presence of insects and disease.
- Trap to quantify pest populations.
- Establish economic thresholds for various crops.
- Use traps, pheromone disrupters, and beneficial insects as alternatives to chemicals.
- Rotate chemicals used in applications.
- Make application as per label instructions.
- Have trained applicators apply, or supervise the application of, pesticides.
- Calibrate equipment and use equipment suited for specific types of applications (i.e. ground, foliar, drench, etc.).

**Other nursery management issues.**

Example conservation practices:

- Recycle nursery wastes and byproducts to restrict their impact on the environment:
  - empty chemical containers
  - plant tissue and residues (through composting)
  - paper products
  - plastic products – poly, pots, & flats
  - metal, glass, wood tires, and oils
- Cover cropping to reduce erosion, build organic matter, provide habitat for beneficial insects and wildlife, and control weeds.
- Fish screening at pump intakes to protect small fish and other aquatic life.
- Control of noxious weeds to prevent degradation of protective native vegetation near riparian areas.
- Set aside less productive land for conservation and wildlife habitat enhancement.

**Streamside Areas**

**Protect and/or restore ecological functions in riparian and wetland areas to improve watershed health.**

Example conservation practices:

- Control of undesirable vegetation.
- Planting native trees and shrubs.
- Allowing snags (dead trees) to remain standing unless safety factors indicate otherwise.
- Allowing fallen trees to remain on the ground or in the stream unless removal is essential for traffic, navigation, or serious flooding reasons.

**Reduce erosion and sedimentation and provide filtering and buffering characteristics.**

Example conservation practices:

- Manage buffer zones
- Grassed waterways
- Stream bank protection

**Allow marginally productive or poorly drained lands in floodplains to revert to riparian or wetland status.**

**Vineyards, Berries, Orchards**

**Reduce erosion and sediment delivery.**

Example conservation practices:

- Annual and perennial cover crops
- Conservation tillage
- Strip cropping
- High density tree cropping
- Straw mulch
- Catch basins
- Grassed waterways
- Vegetative filter strips
- Straw bales

**Limit over application of pesticides and nutrients.**

Example conservation practices:

- Mechanical weed control.
- Apply herbicide under the vine row or spot treat weeds.
- Adopt methods to monitor disease and pest pressure.
- Apply insecticides only at label recommended rates.
- Rotate pest control methods to reduce development of resistance.
- Encourage an open canopy – reduces disease pressure, improves spray penetration and fruit quality.
- Encourage use of new, low impact products.
- Apply nutrients when there is a maximum uptake by the crop.
- Use organic nutrient sources.
- Apply fertilizer based on competent advice and nutrient levels determined by soil and tissue tests.
- Recycle all organic matter.

**Manage and conserve irrigation water.**

Example conservation practices:

- Limit irrigation to young vineyards, shallow soils, or drought conditions.
- Use water sensing devices or physiological indicators to help schedule water applications.

**Encourage botanical diversity within and around the borders of the vineyard to provide favorable habitat for beneficial insects.**

Example conservation practices:

- Alternate mowing (the oldest interrow is mowed when the youngest interrow begins flowering)
- Botanical diversity in cover

**Other Management Areas – Roads, Staging Areas, and Farmsteads**

There are other land uses associated with agriculture that do not fall under a specific type of operation, such as access roads and staging areas. Several conservation practices may be applicable to these areas.

**Minimize soil erosion from access roads.**

Example conservation practices:

- Encourage landowners to cooperate with county or state roads departments to implement roadside management practices.
- Plant and maintain grass cover where appropriate.
- Appropriate culvert construction and design.
- Water bars
- Grading roads

**Manage runoff and contaminants in the farmstead area.**

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## Appendix G: Public Funding Sources for Landowner Assistance

The following is a list of some conservation funding programs available to landowners and organizations in Oregon. For more information, please refer to the contact agencies for each program. Additional programs may become available after the publication of this document. For more current information, please contact one of the organizations listed below.

<b>Program</b>	<b>General Description</b>	<b>Contact</b>
Conservation Planning and Implementation Grants	Provides grants to SWCDs and to landowners for on-the-ground conservation projects.	Soil and Water Conservation Districts, Oregon Department of Agriculture
Conservation Reserve Enhancement Program (CREP)	Provides annual rent to landowners who enroll agricultural lands along fish-bearing streams. Also cost-shares conservation practices such as riparian tree planting, livestock watering facilities, and riparian fencing.	Natural Resources Conservation Service, Soil and Water Conservation Districts, Oregon Department of Forestry
Conservation Reserve Program (CRP)	Competitive CRP provides annual rent to landowners who enroll highly erodible lands. Continuous CRP provides annual rent to landowners who enroll agricultural lands along seasonal or perennial streams. Also cost-shares conservation practices such as riparian plantings.	Natural Resources Conservation Service, Soil and Water Conservation Districts.
Emergency Watershed Protection Program (EWP)	Available through the USDA-Natural Resources Conservation Service. Provides federal funds for emergency protection measures to safeguard lives and property from floods and the products of erosion created by natural disasters that cause a sudden impairment to a watershed.	Natural Resources Conservation Service, Soil and Water Conservation Districts.

<b>Program</b>	<b>General Description</b>	<b>Contact</b>
Environmental Protection Agency Section 319 Grants	Fund projects that improve watershed functions and protect the quality of surface and groundwater, including restoration and education projects.	Oregon Department of Environmental Quality, Soil and Water Conservation Districts, Watershed Councils.
Environmental Quality Incentives Program (EQIP).	Cost-shares water quality and wildlife habitat improvement activities, including conservation tillage, nutrient and manure management, fish habitat improvements, and riparian plantings.	Natural Resources Conservation Service, Soil and Water Conservation Districts.
Federal Reforestation Tax Credit	Provides federal tax credit as incentive to plant trees.	Internal Revenue Service
Forest Land Enhancement Program (FLEP)	Provides educational, technical, and cost-share assistance for several forest stand improvement practices.	Natural Resources Conservation Service, Soil and Water Conservation Districts, Oregon Department of Forestry
Forest Resource Trust	State assistance up to 100 percent of the costs to convert non-stocked forestland to timber stands. Available to non-industrial private landowners.	Oregon Department of Forestry.
Oregon Watershed Enhancement Board (OWEB).	Provides grants for a variety of restoration, assessment, monitoring, and education projects, as well as watershed council staff support. 25% local match requirement on all grants.	Soil and Water Conservation Districts, Watershed Councils, Oregon Watershed Enhancement Board.
Oregon Watershed Enhancement Board Small Grant Program.	Provides grants up to \$10,000 for priority watershed enhancement projects identified by local focus group.	Soil and Water Conservation Districts, Watershed Councils, Oregon Watershed Enhancement Board.

<b>Program</b>	<b>General Description</b>	<b>Contact</b>
Partners for Wildlife Program.	Provides financial and technical assistance to private and non-federal landowners to restore and improve wetlands, riparian areas, and upland habitats in partnership with the U.S. Fish and Wildlife Service and other cooperating groups.	U.S. Fish and Wildlife Service (503) 231-6179, Natural Resources Conservation Service, Soil and Water Conservation Districts.
Public Law 566 Watershed Program	Program available to state agencies and other eligible organizations for planning and implementing watershed improvement and management projects. Projects should reduce erosion, siltation, and flooding; provide for agricultural water management; or improve fish and wildlife resources.	Natural Resources Conservation Service, Soil and Water Conservation Districts.
Resource Conservation & Development (RC & D) Grants	Provides assistance to organizations within RC & D areas in accessing and managing grants.	Resource Conservation and Development, (541) 757-6709.
State Forestation Tax Credit	Provides for reforestation of under-productive forestland not covered under the Oregon Forest Practices Act. Situations include brush and pasture conversions, fire damage areas, and insect and disease areas.	Oregon Department of Forestry
State Tax Credit for Fish Habitat Improvements	Provides tax credit for part of the costs of voluntary fish habitat improvements and required fish screening devices.	Oregon Department of Fish and Wildlife
Stewardship Incentive Program (SIP).	Cost-sharing program for landowners to protect and enhance forest resources. Eligible practices include tree planting, site	Natural Resources Conservation Service, Soil and Water Conservation Districts, Oregon Department of Forestry

<b>Program</b>	<b>General Description</b>	<b>Contact</b>
	preparation, pre-commercial thinning, and wildlife habitat improvements.	
Wetlands Reserve Program (WRP)	Provides cost-sharing to landowners who restore wetlands on agricultural lands.	Natural Resources Conservation Service, Soil and Water Conservation Districts
Wildlife Habitat Tax Deferral Program	Maintains farm or forestry deferral for landowners who develop a wildlife management plan with the approval of the Oregon Department of Fish and Wildlife.	Oregon Department of Fish and Wildlife, Soil and Water Conservation Districts, Natural Resources Conservation Service